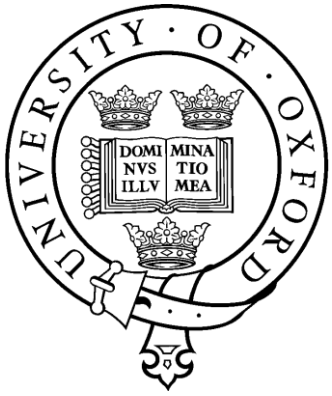
Understanding why Quality Circles work in Primary Health Care: a realist approach about how, why and under what circumstances they work



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A thesis submitted for the degree of

Doctor of Philosophy in Evidence-Based Health Care

Michaelmas Term 2020

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ABSTRACT

Quality circles and similarly structured small groups are commonly used in primary health care in Europe to reflect on and improve standard practice over time. They are a complex social intervention in the fast-changing system of primary health care. Many controlled trials and reviews have documented their positive effects on behaviour change. As effect sizes vary, I sought to understand how and why quality circles achieved their results by using a realist approach.

I conducted a co-inquiry with stakeholders to determine their interests and preferences concerning the direction of my research, and their mental model of quality circles, which I used as a framework for my realist review. After identifying relevant papers and selecting and extracting appropriate data, I labelled and analysed configurations of context and mechanism that shaped the outcomes of quality circle work. From these, I built propositions to develop a programme theory underlying quality circles, then refined and consolidated this in sequential interviews with participants, facilitators and managers of quality circles.

The programme theory suggests that government trust in GPs' ability to achieve quality improvement, with appropriate professional and administrative support, will motivate them to participate in quality circle work. Professional support includes training in relevant techniques, access to educational materials and personal performance data. Administrative support includes protected time, an appropriate venue and financial resources for meetings. Group dynamics are at the core of the process. Facilitators help participants to build social bonds and mutual trust so that the group becomes a safe environment where participants link insights to everyday practice to develop their professional role. They reflect on their personal experiences, add information from evidence-based or personal performance data and thus create new concepts for improving their practice. With repetition, they gain confidence in their quality improvement skills and can put their innovations into practice.

Chapter One: Introduction

I became interested in quality circles (QC) while working as a young general practitioner (GP) in a remote area of northern Sweden. My first job in a Swedish rural practice was challenging, but I was lucky enough to be supported by understanding colleagues in a QC who helped me to settle in. From the very beginning, I was a participant in QCs, where I learned that making decisions in primary health care (PHC) is not the same as making decisions in a hospital. Compared to hospital medicine, I encountered a much broader range of problems that were not well-differentiated – for example, a patient may present with tiredness, a non-specific symptom that can have many causes. Through participation in the QC, I learned that the processes and outcomes are often unclear at the beginning of clinical encounters. The QC taught me that I had to draw on my combined clinical experience and research evidence to care for my patients. Through this process, I have grown into my professional role as a GP.

Like me, many European health professionals in PHC take part in QCs. From my experience, these are small groups of health professionals who meet to reflect on and improve their standard practice. They are learning environments for continuous professional development and quality improvement. Good QCs create a climate of trust and openness. They draw on collective expertise to solve everyday problems, and most participating health-care professionals in PHC approach them with enthusiasm. QCs give them a chance to collaborate, collect and use data to improve healthcare delivery and to solve local problems, including inefficient, harmful or poorly timed medical services. Over the decades that I have been involved with QCs in Sweden and Switzerland, my colleagues and I have examined and evaluated processes in our clinics, linked evidence to everyday practice, learned to deal with uncertainty and devised strategies to improve our practice, ranging from changing our prescription habits to improving our diagnostic strategies. The bottom-up structure of QCs gives us the chance to improve health care for our patients by practising quality assurance and continuous quality improvement.

Later in my career, I returned to Switzerland, became a QC facilitator and, eventually, a trainer and tutor. I joined a network of practices that provides PHC in health care centres. The network signs binding cooperation agreements between health insurance companies and GPs according to which insurers provide less expensive health insurance if patients see a doctor in the network first. The doctor's job is to manage and coordinate care. The network uses QCs as an integrated quality assurance process in its contracts with insurers; the QCs ensure a high level of service. Here, I found that QCs were useful for quality improvement because health-care professionals could focus on local needs and devise strategies to meet them by, for example, adopting evidence-based measures.

A common problem that came up in our QCs was what we meant by quality; there is no consensus on what quality in health care means. In my everyday clinical work, however, the Swiss Health Insurance Act defines quality of care: to be remunerated, we need to provide appropriate, effective, and efficient services. In Switzerland, health-care providers are therefore expected to avoid unnecessary and harmful care and to choose cost-effective treatments that improve patients' health or quality of life in accordance with the interests of both the patients and public health, and as agreed by the insurers. Definitions of quality are important because they affect how we work, particularly if financial incentives are involved.

I believe that patients and other stakeholders can also define quality, based on their interests and the value of our service. Thus, although my clinical practice is generally governed by and aligns closely with the Swiss view of quality, I am aware that other stakeholders may value or measure quality differently. For instance, patient organisations may consider accessibility to be a measure of quality, since disabled patients need to access clinics. Social welfare representatives may focus on equity, asking practices to meet the local health-care needs of people of lower socio-economic status. As a QC practitioner, organiser and administrator, I have found that QCs are flexible enough

to provide the space to discuss stakeholder views of what constitutes quality, and to enable us to find solutions that help meet their needs.

In over two decades of working in our network, I have observed a wide variety of QC processes and outcomes. For example, insurers expect us to use QCs to improve clinical care for people with diabetes. To do this, they have given us data that measure aspects of diabetes care we provide. These data show that clinicians belonging to different practice-based QCs have substantial variations in diagnostic procedures, prescription habits and costs of hospitalisation due to complications. Although these measures of diabetes care cannot and do not fully reflect the complexity of the social process and impacts of a QC, or their effect on diabetes care, they do indicate that QCs perform very differently.

I noticed that variation in clinical care often mirrors a QC facilitators' report of suboptimal processes in the group and, therefore, became increasingly curious about the diversity of QCs and their outcomes. I had regular discussions with representatives of health insurance companies, professional bodies, other tutors, facilitators and participants about how we could account for such variations in clinical care and the role that QCs played in this. I also raised this issue in discussions within the European Society of Quality in Safety in Family Medicine (EQuiP), since QCs are now commonly used for continuous professional development and quality improvement in European countries including Germany, the Netherlands, Ireland, Belgium and Denmark. From our discussions, we came to the consensus that we needed to know more about the underlying mechanisms of QCs and their influence on clinical care. In response, I decided to pursue a DPhil and investigate how the social process in QCs could lead to professional development and improve the quality of primary health care.

Chapter Two: Literature review and research questions

This chapter introduces the concept of quality circles (QCs) and outlines their basic properties and objectives. It includes definitions and key concepts and details their origin, spread and reported effectiveness in changing the behaviours of primary-care providers. It presents the results of a scoping review I conducted to map the literature on QCs because, despite their growing popularity, I could not locate any broad literature surveys on QCs in this area. The protocol for the scoping review is described in the Methods section (Chapter Four). The results section details the number and types of papers I found (Chapter Six). I found that QCs are small groups of 6–12 health-care professionals across Europe who meet regularly to reflect on and improve their standard practice and who appear to have the potential to change practitioners' behaviour. They originated in the manufacturing industries and many countries adopted them for primary health care to continuously improve medical education, professional development and quality of care. QCs are not standardised, and their techniques vary. In Chapter Two, I also describe the gaps in our knowledge and raise questions not answered by the scoping review. I then highlight opportunities for exploration, which I address in this thesis after a co-inquiry with stakeholders, who helped me narrow down the research questions. In summary, this thesis is about how and why the contextual features of QCs, and the different configurations of components in QCs, affect practitioners' performance.

Definitions and key concepts of quality circles

I used the papers identified by the scoping review to explore the definitions and concurrent key concepts of QCs (Rohrbasser et al., 2018). All sources confirmed that QCs comprise small groups of 6–12 health-care professionals who meet regularly to reflect on and improve their standard practice (Ross and Ross, 1982; Schillemans et al., 1989; Lawrence and Schofield, 1993; Gerlach and Bahrs, 1994; Bahrs et al., 1995; Grol and Lawrence, 1995; Marinker, 1995; Gerlach et al., 1998; Fraser et al., 1999; Ennis and Harrington, 1999; Tross, 2003; Beyer et al., 2003; Elwyn et al.,

2004; Ioannidis et al., 2007; Riou et al., 2007; Overton et al., 2009a; Bundesvereinigung, 2013; Sommers and Launer, 2013; Armson et al., 2015; Arvidsson and Elmroth, 2016; Hockl, 2016; Mahlknecht et al., 2016; Fuchs et al., 2017; Dressarts and Martin, 2017; Finnegan, 2017; Rial, 2017; Rohrbasser, 2017). The terms 'practice-based small group work', 'peer review group', 'problem-based small group learning', 'practice-based research group', 'quality circle', 'continuous medical education (CME) group' and 'continuous professional development (CPD) group' were used interchangeably and varied between countries. These labels suggest the basic, original intent of the group. I decided to use the umbrella term 'quality circle' to describe all of them.

Terms like 'peer review group' or 'entre pairs' reflect the principle of equity in a group without a hierarchy. This group of equals creates a climate of trust that promotes a culture of free speech, where discussions of everyday problems are based on collective expertise (Grol and Lawrence, 1995; Shears, 2013; Dressarts and Martin, 2017). It is similar to collegial counselling (intervision), where equals seek to solve an existing problem, e.g. when colleagues describe clinical cases and others help solve them. This is often the starting point for mutual learning (Gerlach and Bahrs, 1994; Eliasson and Mattsson, 1999; Armson et al., 2015). Depending on the country's tradition, QCs may not be limited to GPs but may involve other PHC professionals, including practice assistants (in the Netherlands and Germany) or practice teams (in Scotland), who add perspectives to the QC process (Welschen et al., 2004; Vollmar et al., 2008; Overton et al., 2009b; Overton et al., 2009c; Jager et al., 2013; Jager et al., 2017). Interprofessional collaboration and mutual learning may also involve practice nurses (Overton et al., 2009b) or specialists invited to QCs to share expertise on a specific topic, e.g. pharmacists who contribute to a discussion on prescription patterns (Niquille et al., 2010; Cunningham et al., 2016).

Autonomy seems to be an important principle for successful QCs (Hömberg and Voßschulte, 2010). The groups choose a topic about which they want to learn more or an aspect of quality that they want to improve in their practice. They decide how to approach and solve the problem, and

they create space to consider how to improve clinical practice (Ishikawa, 1985; Lesmes-Anel et al., 2001; Tross, 2003; Dahinden et al., 2005; Bundesvereinigung, 2013; Jensen et al., 2008; Jenson et al., 2006; Wilcock et al., 2013; Zwald, 2013; Francois et al., 2013; Fisher et al., 2013; Shears, 2013; Hockl, 2016; Mahlknecht et al., 2016). The groups choose their own facilitators, who observe and lead the group through a Quality Improvement (QI) cycle. Effective QCs respect the contribution of each individual. This respect is fostered by facilitators who consider the group dynamics and try to keep members focussed without controlling the discussion (Tross, 2003; Grol and Lawrence, 1995; Weiss-Plumeyer, 1995; Watkins et al., 2004; Dogherty et al., 2010; Baskerville et al., 2012; MacVicar et al., 2013; Nielsen and Davidsen, 2017).

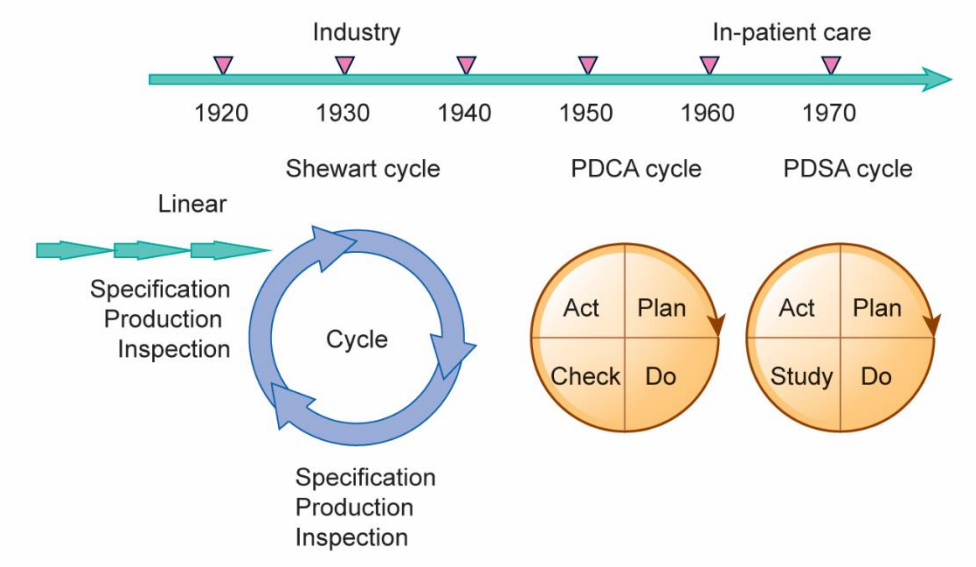
QCs use a combination of techniques, including discussing educational material in a workshop-like environment, contacting local experts, auditing and feeding back on clinical practice with or without outreach visits, facilitating and local consensus processes (Davis et al., 1995; Oxman et al., 1995; Ennis and Harrington, 1999; Gerlach et al., 1994; Gerlach et al., 1998; Wakefield et al., 2003; Niquille et al., 2008; Overton et al., 2009b; Shears, 2013; Fisher et al., 2013; Fuchs et al., 2017). The group may also rehearse clinical skills and use active didactic methods to promote learning, including brain-storming, reflective thinking, self-monitoring and professionally reprocessing patient situations (Bahrs et al., 1995; Elwyn et al., 2004; Sommers and Launer, 2013; Bundesvereinigung, 2013; Andres et al., 2015; Elmslie et al., 2017; Rial, 2017; Rohrbasser, 2017).

Techniques and didactic methods are usually tailored to local contexts and circumstances. The number and difficulty of these techniques and didactic methods, and the outcomes and the context of the group, all affect the process (Davis et al., 2012; Fisher et al., 2013; Andres et al., 2015). QCs are therefore complex social interventions or programmes (Mennin, 2007; Egan et al., 2009) operating within PHC systems, constantly changing in response to new economic situations, scientific developments and cultural pressures. They incorporate social aspects of the workplace that affect team work, self-determination and involvement in management at a day-to-day level.

Origins and intentions of quality circles

In 1924, Shewart created a table that depicted a cycle for continuous control of the QI process. Deming improved this model and introduced the Plan-Do-Check-Act (PDCA) cycle (Fig 2.1) (Best and Neuhauser, 2006). QCs developed first within the manufacturing industry, then spread to the service industry and, finally, to the medical sector (Deming, 1950; Ross and Ross, 1982). The model was used by small groups of frontline workers rather than administrators because workers often know how to improve production. The assumption was that, if workers volunteered to help develop the organisation, they could improve both products and the work environment.

Fig 2.1 Development of the quality improvement process

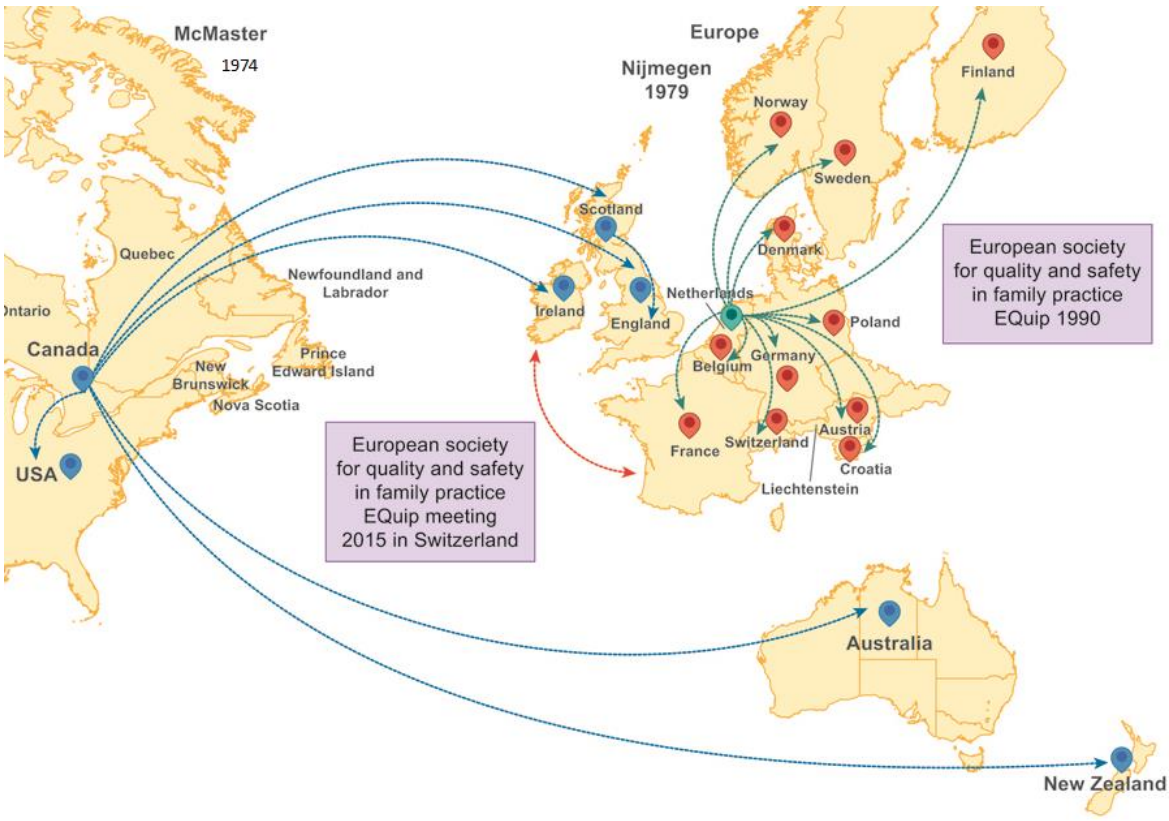


Donabedian (1988) applied the principles of QI to health care across three interdependent quality dimensions: structure, process and outcome. His model of QI in health care was first implemented in in-patient settings and secondary-care clinics in the Netherlands. QCs in health care met a need for participative group problem-solving approaches and shared responsibility for decision-making in rapidly expanding and expensive health-care systems (Schmele et al., 1991). QCs in PHC originated in two centres: McMaster University in Canada and the University of Nijmegen in the Netherlands. In their undergraduate programmes, both universities promoted Problem-Based

Learning (PBL), which presents a group of learners with a problem they have to solve, requiring them to actively participate in learning about the related issues (Wood, 2003).

In 1974, at McMaster, Premi (1974) presented the results of six years' experience of GPs who met on a regular basis to exchange thoughts about clinical cases to increase and update their knowledge. This programme mainly addressed GPs' needs for lifelong learning. As teachers, academics and policy-makers built networks, the programme spread from McMaster, Canada, to Ireland, Scotland and England and, eventually, to the USA, Australia and New Zealand as shown in Fig 2.2 (Walsh et al., 2009; Garbutt et al., 2015; Finnegan, 2017; Rial, 2017; Elmslie et al., 2017).

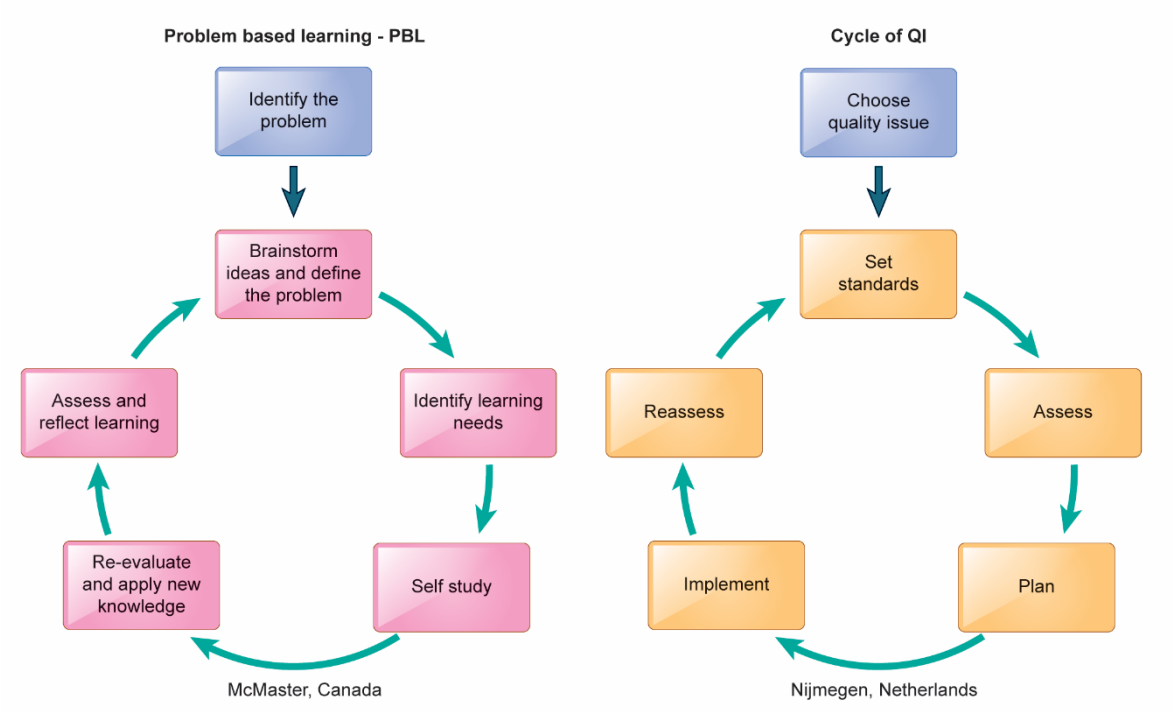
Fig 2.2 Spread of quality circles



In 1979, at the University of Nijmegen, Netherlands, PBL was implemented experimentally within small groups of GPs who met voluntarily on a regular basis to continuously and autonomously improve their knowledge through peer interaction (Beyer et al., 2003). Just as Dutch hospitals had adopted Donabedian's dimensions of quality in health care, so the Dutch GPs adopted them in their

small group work. Gradually, they transformed the learning cycle into a QI cycle, as their focus shifted from learning to improving practice, as depicted in Fig 2.3 (Grol et al., 1994; Newton et al., 1992).

Fig 2.3 Transformation of the learning cycle into a quality improvement cycle



They combined the didactic techniques from PBL with communication skills and understanding of group dynamics from industrial small-group work. The use of QCs in health care differs significantly from how they were used in the manufacturing industry. In manufacturing, workers helped to improve the product or production process in a very structured work-flow pattern whereas, in health care, professionals address processes and outcomes that are initially unclear in clinical encounters. When the European Society for Quality and Safety in Family Medicine (EQuiP) was founded, it became a communication channel through which developments such as QCs were shared. QCs then spread rapidly from the Netherlands to many other European countries (Fig 2) (Rohrbasser et al., 2018). In 2015, I organised a conference in Fischingen, Switzerland, on QCs in PHC, where representatives of these very similar movements documented the range of

elements they included in QCs, characterised their underlying mechanisms and explored the local context in which they operated.

The knowledge and skills acquired during early medical education must be regularly updated through continuous medical education (CME), which helps medical professionals apply new knowledge via continuous professional development (CPD) (Davis et al., 1999a; Nambiar, 2004; Davis, 2006; Forsetlund et al., 2009). CME and CPD are necessary prerequisites for quality improvement (QI) (Renschler, 1992; Renschler, 1995; Quasdorf, 2008; Czabanowska et al., 2012). QI is a data-guided activity that improves health-care delivery by solving local problems, such as inefficient, harmful or badly timed health care (Ogrinc et al., 2008; Glasziou et al., 2011). In some European countries, QCs seem to play a major role in QI; in others, they are primarily a form of CME and CPD (Beyer et al., 2003).

The qualitative literature and background papers describe the benefits of QCs. GPs seem to prefer learning in small groups (Renschler, 1992; Lesmes-Anel et al., 2001; Vollmar et al., 2009; Overton et al., 2009a; Francois et al., 2013) that help them link evidence to everyday practice (Watkins et al., 2004), learn to deal with uncertainty (Sommers et al., 2007) and show them how to improve practice and feel secure in their professional roles (Fisher et al., 2013). QCs are a vehicle for discussing issues and reflecting on practice, which may raise self-esteem (Overton et al., 2009c; Frich et al., 2010). Frequent participation strengthens team-based strategies for preventing errors (Gehring et al., 2013). Talking about their practice performance in groups can take participants outside their comfort zone, causing anxiety and generating a stress response (Henriksen and Hansen, 2004; Frich et al., 2010) but this stress response may improve communication skills and create a learning opportunity (Gehring et al., 2017; Nielsen and Davidsen, 2017). Several groups of authors note that working in small groups may help prevent burnout and give general practitioners a sense of belonging, leading them to change workplace less often (Jenson et al., 2006; Brondt et

al., 2008; Peterson et al., 2008; Kjaer et al., 2014; Zaher and Ratnapalan, 2012; Nielsen and Davidsen, 2017).

Reported effectiveness and significance of quality circles

I examined 24 quantitative studies and one systematic review (SR) extracted from the 58 papers I retrieved, and determined whether they claimed that QCs promote behaviour change. Ten papers aimed to determine whether QCs promote adherence to guidelines but they vary considerably in study design and outcomes. Evidence that QCs change guideline adherence is inconclusive, since four authors reported limited validity for their positive results and four randomised controlled trials (RCTs) on the topic showed no effect. I found 15 papers, including one that summarised three studies, and one SR, that suggest QCs may improve individual and group performance by reducing costs, encouraging professionals to order fewer but more appropriate tests and improving prescription habits and reporting of critical incidents. However, their reported effectiveness varied substantially within and between studies (Table 2.1).

Table 2.1 Effectiveness of quality circles

First authors/year	Study type	Intervention	Effective
		Guideline adherence improved	
Hartmann et al., 1995	Controlled before-and-after	Diabetes type 2	(Yes)
Ioannidis et al., 2007	Case series	Osteoporosis, pilot	(Yes)
Ioannidis et al., 2009	Interrupted time series	Osteoporosis	Yes
Mahlknecht et al., 2016	Case series	Chronic diseases	(Yes)
Elward et al., 2014	Controlled before-and-after	Asthma	(Yes)
Goldberg et al., 1998	Randomised controlled	Hypertension and depression	No
Lagerlov et al., 2000	Randomised controlled	Asthma and urinary tract Infections	Yes
Schneider et al., 2007	Randomised controlled	Asthma	No
Wilcock et al., 2013	Randomised controlled	Dementia	No
Jager et al., 2017	Randomised controlled	Polypharmacy	No

First authors/year	Study type	Intervention	Effective
		Prescription quality improved	
Dyrkorn et al., 2016	Controlled before-and-after	for antibiotics	Yes
Welschen et al., 2004	Randomised controlled	for antibiotics	Yes
Gjelstad et al., 2013	Randomised controlled	for antibiotics	Yes
Vervloet et al., 2016	Randomised controlled	for antibiotics	Yes
Rognstad et al., 2013	Randomised controlled	in general, for elderly	Yes
Richards et al., 2003	Historically controlled study	in general	Yes
		Prescription quality improved and/or costs decreased	
Wensing et al., 2004	Controlled before-and-after	Prescription quality and costs	Yes
Wensing et al., 2009	Controlled before-and-after	Prescription quality and costs	Yes
Niquille et al., 2010	Cohort	Prescription quality and costs	Yes
Riou et al., 2007	Cohort	Prescription costs	Yes
		Test ordering quality improved and/or costs decreased	
Verstappen et al., 2003	Randomised controlled	Test ordering quality	Yes
Verstappen et al., 2004a	Randomised controlled	Test ordering quality	Yes
Verstappen et al., 2004b	Randomised controlled	Test ordering quality and cost reduction	Yes
		Patient safety improved	
Verbakel et al., 2015	Randomised controlled	Reporting critical incidents	Yes
Zaher and Ratnapalan, 2012	Systematic review	Behaviour change	Yes

Legend:
( ) denotes that authors report limited validity of the results

Several QI tools enabled the groups to change behaviour and improve performance, including interactive meetings, educational outreach visits, local opinion leaders, journal club techniques, skilled facilitation and multifaceted interventions. QCs use different quality improvement tools and combine these depending on the topic. According to Woodward (2000), these tools can be classified by their predisposing, enabling and reinforcing effects on professionals. Predisposing tools incline people to provide care in a specific way. Enabling tools help people to introduce

change into their practice. Reinforcing tools motivate people to provide higher quality care (Woodward, 2000). QCs use interactive meetings, educational outreach visits, local opinion leaders and journal club techniques as predisposing tools that seem to be effective (Davis et al., 1999a; O'Brien et al., 2007; Forsetlund et al., 2009). SRs and one RCT addressing facilitation show that this technique enables participants to introduce change (Dogherty et al., 2010; Baskerville et al., 2012). Finally, QCs' use of multifaceted interventions, peer review, audit and feedback reinforce behaviour change (Gill et al., 1999; Arnold and Straus, 2005; Roberts et al., 2012; Ivers et al., 2012; Cadogan et al., 2015) (Table 2.2).

Table 2.2 Systematic reviews and randomised controlled trials of techniques used in quality circles

First authors / year	Tool	Study type	Effect
Predisposing			
Davis et al., 1999a	Interactive CME meetings	SR	+
Davis et al., 2006	Self-assessment	SR	-
O'Brien et al., 2007	Educational outreach visits	SR	+
Bowie et al., 2008	Significant event analysis	SR	+ / -
O'Brien et al., 2001, Forsetlund et al., 2009	Educational meetings and workshops	SR	+
Harris J. et al., 2011	Journal club	SR	+ / -
Flodgren et al., 2019	Local opinion leaders	SR	+
Giguere et al., 2012, Farmer et al., 2008	Printed educational materials	SR	+ / -
Enabling			
Grimshaw et al., 2012	Clinical guidelines	SR	+ / -
Dogherty et al., 2010, Baskerville et al., 2012	Facilitation	SR	++
Baker et al., 2010, Baker et al., 2015	Tailored interventions	SR	+
Parmelli et al., 2011	Change in organisational culture	SR	+/-
Reinforcing			
Gill et al., 1999	Multifaceted interventions to improve prescribing	SR	+
Arnold and Straus, 2005	Multifaceted interventions to improve antibiotic prescribing	SR	+
Roberts et al., 2012	Peer review	RCT	+

First authors / year	Tool	Study type	Effect
Ivers et al., 2012	Audit and feedback	SR	++
Cadogan et al., 2015	Multifaceted interventions to improve test ordering	SR	+

Legend
+ / - no conclusive evidence
+ small effect
++ significant effect

QCs are widespread across Europe. According to a survey conducted by EQuiP in 2000 and presented at the European WONCA (World Organisation of National Colleges, Academies and Academic Associations of General Practitioners/Family Physicians) Conference in 2000, QCs had been established in nine of the 26 participating European countries (Austria, Belgium, Denmark, Germany, Ireland, the Netherlands, Norway, Sweden and Switzerland) (Beyer et al., 2003). An updated survey showed that QCs had become a more popular means of QI in primary health care and that countries with active QCs in 2000 had extended their range of activities (Rohrbasser et al., 2019). In Finland, France and Scotland, QCs expanded rapidly and play an important role in CME, CPD and QI. In the Netherlands and Ireland, QCs are an essential part of QI. In Germany, QCs often form part of integrated or selective contracts in health care and approximately 50% of family physicians participate regularly in QCs (Härter and Tausch, 2004). In Switzerland, 80% of primary health-care physicians who responded to the survey said that they regularly attend QCs (Meyer-Nikolic and Hersperger, 2012). Scotland and Wales introduced QCs to replace a pre-existing outcomes-driven incentive scheme (Smith et al., 2017; Rohrbasser et al., 2017).

Unanswered questions in the literature

In every study reporting that QC techniques changed behaviour, the authors noted considerable variation both within and between studies. They documented that behaviour changed but could not explain why (Table 1.1). SRs and RCTs studying QC techniques evaluated the impact or effectiveness of individual techniques, but QCs often combine techniques and, in these cases, it was not clear how much each technique contributed to the overall effect (Table 1.2) (Gill et al.,

1999; Arnold and Straus, 2005; Cadogan et al., 2015).

To determine how and why techniques do or do not work, each step in the intervention process needs to be described in detail (O'Brien et al., 2007; Forsetlund et al., 2009; Flodgren et al., 2019; Grimshaw et al., 2012) so that we can evaluate its effectiveness, alone and in combination. Steps could include, for instance, combining printed educational material with input from local opinion leaders, CME workshops or outreach visits (Giguere et al., 2012; Grimshaw et al., 2012). The different contextual features of health-care systems must be accounted for, and researchers need to understand the roles that these features play at each level. For instance, at the group level, professionals with different backgrounds may not all be equally involved in QI. At the institutional level, support for QC groups may vary. At the national policy level, responsibility for QI may remain with locally organised small groups or may be directed at a higher level (Rubenstein et al., 2002). We do not yet know which techniques should be used or what circumstances encourage QC participants to change their behaviour (Baker et al., 2015). For example, audit and feedback interventions typically produce heterogeneous effects, and the underlying reasons for behaviour change after audit and feedback need to be identified in order to know when to deliver this intervention, how best to design it and how to optimise it in routine practice (Ivers et al., 2012; Hysong et al., 2017).

To date, the literature highlights unanswered questions about aspects of how QCs work. Small group work succeeds in CME, but we should ask how and why it could work or fail for quality projects (Fisher et al., 2013). What resources do small groups offer GPs to support changing their behaviour (Ioannidis et al., 2009)? What is it about QCs that can improve the clinical performance of GPs? What group factors are crucial to improving outcomes (Wensing et al., 2009)? How frequently should the group process be repeated (Ivers et al., 2012; Wilcock et al., 2013; Verbakel et al., 2015)? In their SR, Cadogan et al. argue that research should be designed to improve our understanding of when, how and why interventions such as education or providing guidelines are

likely to be effective and how they can be improved. These studies should be based on a theory that can explain changes in clinical practice (Cadogan et al., 2015).

Research questions

The scoping search showed that QCs may positively influence professional role perception and self-esteem, which could explain their broad, international adoption. The reported effects on prescribing behaviours or process changes, however, vary substantially between studies. During the process of co-inquiry (described in Chapter Four) stakeholders with expertise in QCs in Switzerland recognised their effectiveness but had the same questions as the authors of studies on quality circles: which components are common to the successful groups and which contextual features may improve the process at group level, institutional level and policy level? Based on the literature and talking to stakeholders during the co-inquiry, I identified my research questions:

A) How and why do different configurations of components in QCs in primary health care affect practitioners' performance?

This question is designed to explore the factors or components of QCs that influence practitioners' performance.

B) How and why do the contextual features of QCs affect practitioners' performance in primary health care?

This question is designed to explore the nature and effects of contextual factors on QC outcomes.

Given the gaps in knowledge that I identified in the literature and the answers stakeholders wanted the research project to provide, I set out to identify the forms of QC most likely to change behaviour and the conditions under which QCs are most likely to achieve this – or not. My goal was to synthesise evidence from different sources (primary and secondary) and develop a programme theory that, firstly, suggests a common language of terms and conditions to be used by

stakeholders and participants when they discuss, plan, conduct and evaluate QCs; secondly, that provides an in-depth understanding of QCs enabling me to recommend how policy-makers could implement QCs and improve their reliability and effectiveness as interventions for behaviour change and, thirdly, that can be used in the future to build a monitoring framework to enable participants and facilitators to assess and identify possible problems in the process of QCs.

A shared programme theory will make it easier for organisations to network and develop teaching materials for training and practice. This networking and development of materials are the objectives of the EQuiP working party on QCs, but do not form the central focus of my research. I have limited my research to understanding how QCs work in primary health-care settings in countries with a documented history of QCs, including European countries, Canada (Figure 2.2) and local initiatives in the USA, Australia, New Zealand and South Africa (WONCA, 2011).

Chapter Three: Methodology – rationale for my approach

In Chapter Three, I explain why I chose a realist approach and the implications of this choice, including its effect on my role as a researcher among colleagues and stakeholders. The research design emerged and continued to evolve along with the project. QCs are a complex intervention in the already complex environment of primary health care. I discuss complex interventions in general and examine different approaches to studying them. This section covers how the realist approach requires specific research processes, such as the use of theories and the development of programme theory. It also covers analytical methods including theorising and abductive reasoning, both common in the realist philosophy of science. I show how the programme theory evolved through the successive phases of my research.

Representatives of various organisations, policy-makers and QC users at different levels worked with me to create the basic research plan. We used a participatory research approach, so that different players could share their perspectives when we developed the research questions, methods and analysis, and when we considered the implications of the results. In this section, I introduce the concepts of collaborative and participatory research and describe how they are used in this work. My role in the research was that of a participant-researcher, which poses the risk of interpretive bias. I endeavoured to mitigate this risk by striving for methodological rigour in combination with self-reflection.

Ontology and epistemology of the realist approach

QCs are a complex intervention in the already complex PHC environment. The intervention is complex because participants use varying didactic techniques and QI tools depending on the topic. In addition, GPs and other PHC professionals are individuals who will perform differently every time they participate in a QC and the context of the group or workplace may also shift as a result of their own actions. The PHC system has constantly shifting properties resulting from interaction

effects and feedback from the prevailing economic, scientific development and cultural circumstances. QC members, thus, operate within the broader health-care system, and are influenced by both contextual features and outcomes, which shape their future work (Plsek and Greenhalgh, 2001; Rickles et al., 2007; Shiell et al., 2008). QCs are also complex social interventions or programmes, demanding that participants engage with the social aspects of the workplace that affect team-work, self-determination and involvement in management (Egan et al., 2009). This dependence on context makes QCs difficult to standardise, and the targets of QC interventions will vary according to organisational level and patient population (Crabtree, 2003). Finally, QCs may be inconsistently applied over an indeterminate period, and participants may experience a learning curve.

Complex interventions like QCs are difficult to examine; one of the more suitable methodologies to use is the realist approach, a common choice for studying complex interventions in health care (Wong et al., 2013; Wong, 2018). Researchers adopt realist approaches when gaining an understanding of empirical outcomes is more important than quantifying them. For example, when we look at QCs, it is not sufficient to determine that they are effective; we want to know why and how they have an effect in order to improve them. A realist analysis focusses on the theoretical basis of the intervention, and accounts for the differences in performance that depend on the context and content of QCs and their application. Such an analysis can help us understand how and why complex interventions such as QCs function well (or do not) in different contexts, for whom, and to what extent. Realist approaches also account for human agency, crucial in the study of QCs, since it is individuals who participate in and perform the intervention (Pawson et al., 2005; Walshe, 2007).

The realist approach I use is that developed by Pawson and Tilley (1997), based on the philosophical principles of Scientific Realism. In any philosophy of science, its ontology describes the nature of reality and underlying assumptions about the nature of being. Its epistemology

describes beliefs and underlying assumptions about the nature of knowledge and how we learn. Ontology in realism assumes that reality exists independently of human senses, thoughts or beliefs. It is a reality we cannot fully understand through experience because we have limited ability to perceive our world (Haig and Evers, 2016). However, although we cannot know the world completely through our own perception, we can learn about it through empirical methods. Epistemology in realism thus claims that it is possible to gain knowledge and understanding of mind-independent reality based on the interpretations and inferences we gather through our senses. Bhaskar (2008) argues that we can distinguish between three different ontological domains, which he calls 'stratified reality', to conceptualise the world. In the domain of the empirical, we experience and observe (empirically verify) events. The domain of the actual is where things happen, whether we see them or not. The domain of the 'real' includes both the previous domains and the realm of causality, where the underlying causal processes form an emerging reality; it is the realm of mechanisms where underlying causes generate what happens and exists (Bhaskar, 2008; Emmel et al., 2018). According to this stance, mechanisms are part of the real domain and cause outcomes immediately or later in the actual or the empirical domains, which may explain why mechanisms are often invisible (Emmel et al., 2018).

The scientific realist approach set forth by Pawson and Tilley (1997) allows the researcher to link the context that may belong to the actual or empirical, and the mechanism (part of the real), to an outcome (empirical) to explain how, why and when something happens (Emmel et al., 2018). Pawson and Tilley (1997) argue that researchers must look for social mechanisms at the level of human reasoning; programmes do not cause outcomes themselves but, rather, offer something to the people who take an action or not, as a result of what is offered (Dalkin et al., 2015; Astbury and Leeuw, 2010). For instance, a QC group may provide a high level of trust that makes people feel safe, so that they are prepared to talk about critical incidents in their practice. Thus, their reasoning, followed by a decision to act or not, depends on the context. A programme such as QC is designed to change the context in such a way that the desired mechanism generates the intended outcome.

The context may be also conceptualised as a resource, for example, the QC programme that provides skilled facilitators.

In order to investigate the relationship between context, mechanism and outcome and to discover how, why and when a complex intervention like QC functions, I needed to use both quantitative and qualitative data to interpret the chains of events (Walshe, 2007). I did so by building Context-Mechanism-Outcome (CMO) configurations, looking at chains of events, attempting to discern the underlying mechanisms and exploring how and why certain contextual factors influenced outcomes.

The scientific realist approach set out by Pawson and Tilley (1997) allows the use of multiple sources of data, including literature, training material, and qualitative data from experts and users of the programme. Each source and method may add particular data to the programme theory – the theory or theories that underlie QC (Pawson et al., 2005; Pawson, 2006). The realist approach also incorporates the researcher's own reflections and participant-observer status in the research process (Rycroft-Malone et al., 2012).

A programme theory is the theory or theories that underlie a complex intervention such as QC. The programme theory presumes that QCs are theories put into practice. My goal is to identify and describe the programme theory on which QC is founded. A realist programme theory should be middle-range, i.e. at a level of abstraction that allows hypotheses to be derived that are amenable to empirical investigation. It describes the intervention and its activities and explains its outcomes (Funnel and Rogers, 2011).

Programme theory can inform research by focussing the researcher on knowledge gaps and helping them formulate the questions that seem most important. It may help to develop search terms for literature searches and improve assessment, as it guides interpretation. Programme theory can act as a framework for analysing and recognising patterns in the data, providing explanations for the

programme's success or failure, and may offer a basis for causal attribution. If programme theories are middle range, they allow empirical investigation (Davidoff et al., 2015; Wong et al., 2017).

Programme theory can also be used to help policy-makers formulate policy (Leeuw, 2003; Astbury and Leeuw, 2010; Funnel and Rogers, 2011). It can foster a common language and common understanding of QCs and empower and engage the various stakeholders, facilitating discussion of the programme from different perspectives and its improvement. Programme theory may provide basic information for developing communication tools to instruct others about how QCs operate and what advantages they may have. Within evidence-based policy and practice, middle-range programme theory allows us to document when and how QCs function well and to directly monitor and evaluate them (process evaluation or outcome monitoring). Mid-range programme theory can also tell us how QCs could be transferred to other similar contexts and populations.

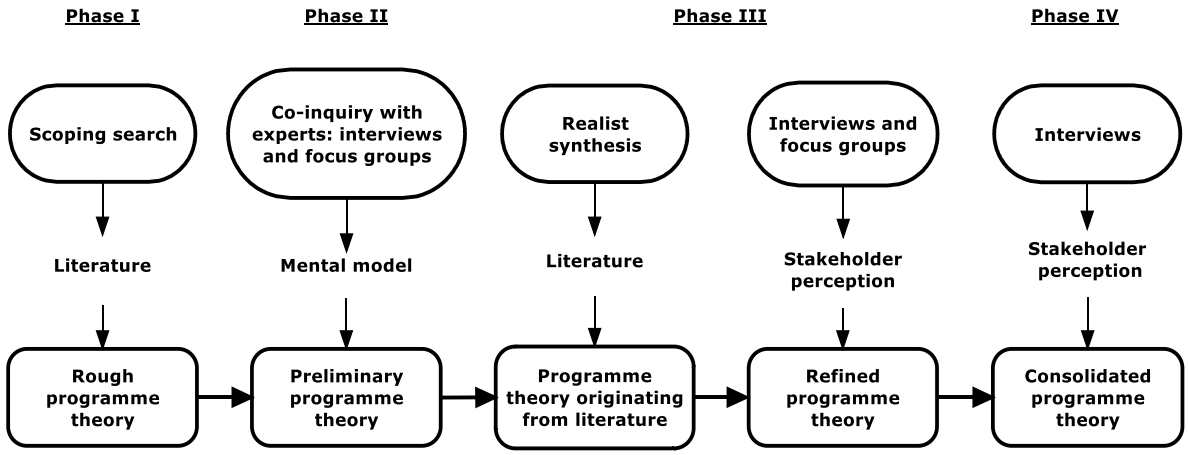
To develop the arguments that underpin my programme theory, I had to interpret and make inferences from the data. When interpreting and making sense of data, I used one of three basic types of logical reasoning: deduction, induction or abduction. In deductive reasoning, researchers draw conclusions from a specific set of data based on a general rule, a theory that has not yet been proven false. In inductive reasoning, researchers draw conclusions by extrapolating from a specific set of facts (e.g. data) to a general rule (e.g. a theory). Abductive reasoning begins with a set of observations (e.g. incomplete sets of data or data that do not appear to match other data) and then looks for the likeliest and best explanation for the observations; it is also known as inference to the best explanation (Kapitan, 1992). Abduction is thus both logical and creative and, arguably, necessary in theory-driven research, such as realist approaches, when researchers want to develop programme theory from different types and sources of data (Meyer and Lunnay, 2013). The best explanations lead to (threads of) theories that clarify how a programme such as QC works.

An ideal theory has a high level of explanatory coherence, based on three criteria (Thagard, 1989; Haig and Evers, 2016): consilience, simplicity and analogy. A theory is consilient if it accounts for

more of the data than do competing theories. It is simple if fewer additional hypotheses are needed to explain exceptions than in competing theories and it is considered analogous if it corresponds to and shows similarities with theories already known. In a realist understanding of the world, there are no definitive theories, and knowledge remains partial; discovery is an ongoing process.

I used various data sources to develop my QC programme theory. In the training materials, I found information on the motivations behind QC development and on QC objectives. From the data that QC participants, managers and policy-makers provided in their interviews and group processes, I learned which outcomes were important to them and this data helped me understand the intended and unintended outcomes. From research papers, I gleaned data and theories about QCs. Thus, this research uses quantitative and qualitative data, offering different perspectives when I developed the programme theory in its various phases (McEvoy and Richards, 2006; Funnel and Rogers, 2011) as shown in Figure 3.1.

Figure 3.1 Development of programme theory



PHASE I: My scoping review of the literature, which included formal and informal documentation, provided sufficient information to form a rough programme theory.

PHASE II: The co-inquiry with stakeholders and experts on QCs helped me to focus my research question. I learned how the stakeholders thought the programme should work and, from this, I

could generate a mental model of the programme. I used the mental model to refine the rough programme theory into a preliminary programme theory.

PHASE III: Using the realist approach to conduct a literature review allowed me extract data and threads of theories from academic papers and informal documentation of the programme and I used these to improve the preliminary programme theory. After the stakeholders had analysed and critiqued my literature-based programme theory, I compared it to their mental models and was able to refine my programme theory (Manzano, 2016).

PHASE IV: After describing the programme theory, I gathered data from key stakeholders across Europe and used their input to consolidate my programme theory. The emphasis was on the contextual level of official bodies and the institutional setting that may have an impact on QCs (Manzano, 2016).

Use of a collaborative, participatory research approach

In collaborative research, communities and policy-makers actively engage in the research process (Zwarenstein et al., 2009; Smith et al., 2009). Together, they identify the problems that need to be addressed and define the questions that need to be answered. They work together to interpret the results and judge their significance for future change. Finally, they disseminate the findings and encourage necessary changes. I planned and conducted this research in collaboration with different players in primary health care: tutors, facilitators, practitioners attending QCs, representatives of professional organisations and health insurance companies. These partnerships functioned at different levels, and across different organisations. I also gained knowledge and skills by collaborating with my thesis supervisors, who were part of the research team (Katz and Martin, 1997).

Participatory research is a paradigm that encompasses the whole process of research, from planning to implementation (MacAulay et al., 1999). In this case, it included co-learning and mutual learning

in a respectful partnership that was strengthened when we came together to plan research questions, study design, methods of analysis and dissemination. Participatory research is empowering and increases the competence of participants (Jagosh et al., 2012), allowing them to contribute their insight and understanding. They may be in direct contact with QCs or have experienced them; they may be able to understand the underlying concepts of QC or have practical knowledge (Onwuegbuzie et al., 2009). Tutors, facilitators, practitioners and other representatives, all contributed their perspectives and knowledge based on their personal or professional experiences. The participatory process began as a collective action among stakeholders, including me, and started when I was given the opportunity to conduct this research at the University of Oxford in 2013. My intention was to include multiple perspectives in order to improve understanding of QCs and their implementation (Blackstock et al., 2007).

Participatory research is a joint process between scientists and practitioners, stakeholders or experts that produces new knowledge and insights (Bergold and Thomas, 2012). I worked with stakeholders and experts on QCs to narrow the research question. I designed the study together with my supervisors, but the stakeholders and experts offered their resources to conduct it. The stakeholders and experts participated in data analysis but left it to me to report the results. They helped disseminate the findings and responded to the results as they were made explicit (Stoecker, 1999). Involving staff and other stakeholders in evaluation studies increases the relevance of the programme and makes the results more credible to users (Dawson and D'Amico, 1985; Pawson and Tilley, 1997; Jagosh et al., 2011;, Jagosh et al., 2012). Participatory research is an iterative process that broadens mutual understanding. It gave me greater insight into the contextual features of QC and into the underlying dynamics of human agency. Its synergistic effects helped me exceed what could have been achieved by one researcher alone, or even by a group of researchers (Jagosh et al., 2012). A democratic attitude is required to produce synergies; I treated participants as equals and respected their knowledge. Since I sought dissenting views, it was essential to create an

atmosphere of trust in which the participants felt safe revealing their personal opinions and experiences (Jagosh et al., 2012; Bergold and Thomas, 2012).

In participatory research, the researchers' (avowed) objectivity and neutrality is replaced with reflexivity (May, 2005). In classical research settings, the relationship between the researcher and research subjects is portrayed as neutral or invisible, but in participatory research participants are equally informed partners whose differing perspectives are necessary to the study process. Reflexive researchers have to reflect on their personal assumptions, values, experiences and social relationships with research partners to avoid distorting results and threatening internal validity (Bergold and Thomas, 2012; Wright et al., 2013).

As a reflexive researcher, I am aware of my roles, values and status, and I tried to keep them transparent. As a practitioner, trainer and facilitator, and part of the management team, I used my experience and expertise to guide the research while respecting stakeholders' critique and input. Being a practitioner enabled easy access to colleagues and stakeholders, since we shared similar disciplinary perspectives and prior relationships that facilitated the translation of knowledge. A common language simplified the development of rapport and trust with colleagues and other stakeholders, and made them more willing to contribute to the research and participate in interviews (Jagosh et al., 2012).

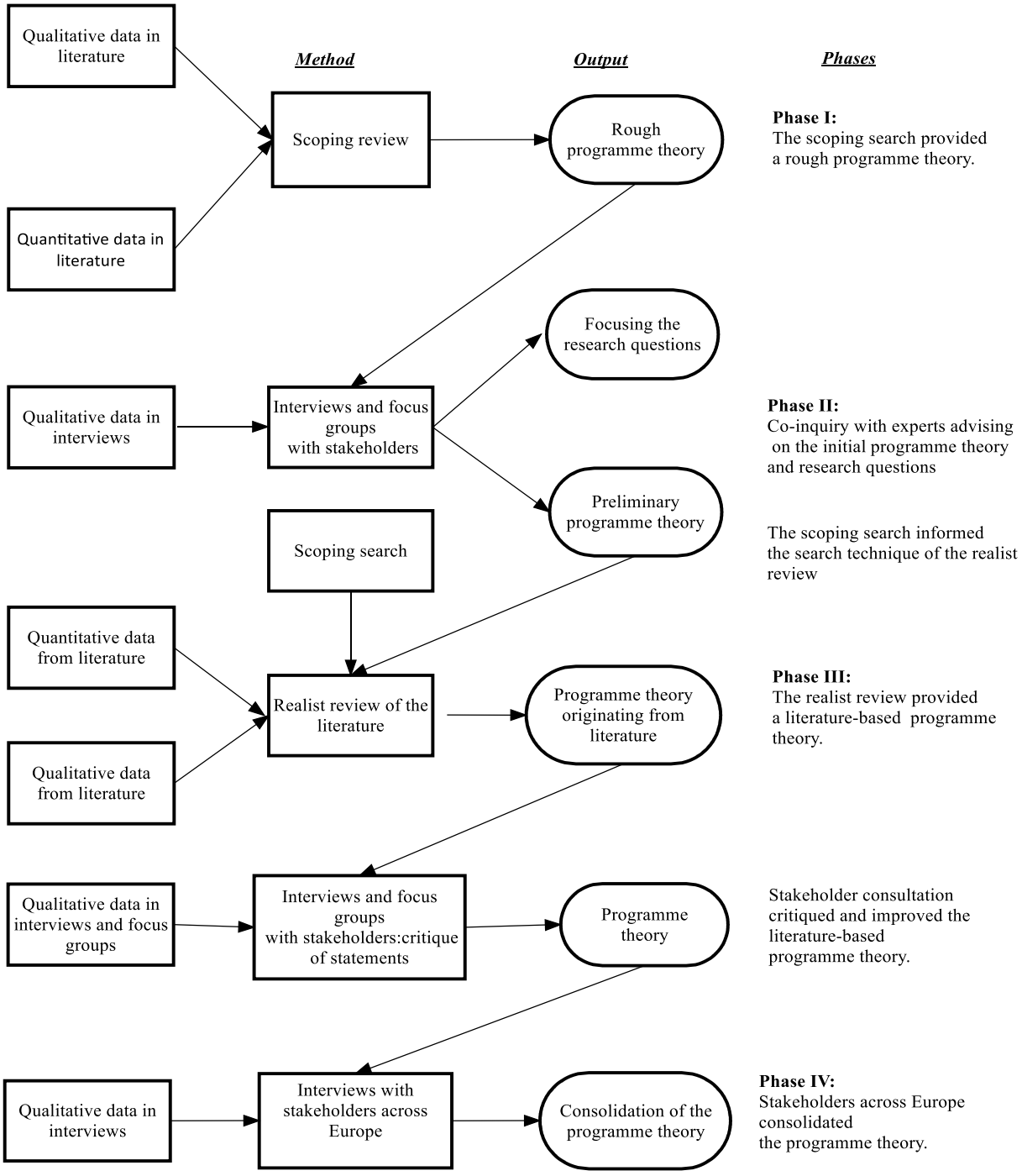
I have worked as a family physician for more than 25 years and, thus, have a patient-centred clinical background. As a member of the National Committee of Quality in Family Medicine and a supervisor and trainer of facilitators, I am familiar with all levels of QI in Swiss family medicine. At the European level, my involvement in EQuiP gave me the opportunity to network with colleagues from 32 countries. At bi-annual meetings, we exchanged ideas about varied aspects of quality in primary health care, and these discussions raised my awareness of international standards of QI. Working in the management of a network that provides primary health care, I gained insight

into managerial issues and came into contact with the representatives of health insurance companies.

Chapter Four: Methods

This multi-method investigation addressed the question of how and why QCs function in primary health care, using Pawson and Tilley's (1997) realist logic of analysis. A programme theory promised to provide an in-depth understanding of QCs that could explain how mutual learning in a social context improves standard practice, and I attempted to develop it in the following way. I searched the literature and conducted a scoping review, before conducting a co-inquiry with experts from Switzerland and other European countries who narrowed the research questions and provided a preliminary programme theory. I synthesised evidence from literature-based sources to refine this preliminary programme theory and used evidence from interviews to refine the resulting literature-based programme theory. Experts from across Europe then offered their personal perspectives, relating their experiences of successful and failing QCs in different contexts, which helped me consolidate the programme theory. Figure 4.1 gives an overview of the research process.

Figure 4.1 Overall design of the project



Phase I – Scoping and mapping the literature and building a rough programme theory

Unlike systematic reviews, which are based on strictly defined research questions, the questions on which scoping reviews are based are broadly formulated. Their goal is to map the literature in a new area of interest, search for definitions and identify and describe key concepts (Pham et al., 2014). The approach to developing a search strategy is stepwise and iterative. In contrast to systematic reviews, researchers do not pre-specify inclusion and exclusion criteria. Since the form and type of data the search will identify are unknown, data extraction templates must develop in tandem with the search (Levac et al., 2010; Moher et al., 2015). Scoping reviews do not formally assess the methodological quality of studies or data; instead, they cast a broad net to capture sufficient papers to suggest answers to the wider questions they ask. A scoping review lays the groundwork for further research, in my case, the realist review (Armstrong et al., 2011; Pham et al., 2014). A scoping review may also consult literature and media resources, including selected books and websites, to supplement the results of the literature search (Arksey and O'Malley, 2005). I intended this scoping review to help to define QCs, describe their origin and intentions, explore their effectiveness in the context of PHC and identify knowledge gaps. It comprised several steps, which followed the guidelines for conducting systematic scoping reviews (Peters et al., 2015). First, I identified literature on QCs and determined what kind of studies described and defined them. I then determined the origin of QCs and how they spread. I also described their intentions and reported benefits, and reviewed their reported effectiveness on behaviour change. Finally, I summarised the questions which remain unanswered in the literature. In addition, I identified (threads of) theories that explained how QCs function and connected them to build a rough programme theory as a basis for the realist review (Rohrbasser et al., 2013).

I carried out iterative literature searches and included all articles published up to April 2013, followed by an update when I added literature published to December 2017. I initially ran a limited

search on the term ‘quality circle’ in PubMed to identify papers and then collaborated with an experienced librarian to expand the search. Together, we analysed text in the titles and abstracts and the articles’ indexing terms to generate a broader list of search terms. Iterative searching revealed descriptive terminology, such as ‘quality improvement’, ‘group functions’ and ‘primary care’ (Appendix 4.1). We retrieved literature from Medline, Embase, PsycInfo and CINAHL without language or time restrictions and downloaded the citations to Endnote X8. I also used the snowballing technique, starting with key references in papers, used software functions such as ‘similar citations’ and searched for additional papers using the Web of Science (Glasziou et al., 2001).

To clarify the scope of definitions and describe the processes of QC implementation, I searched websites in countries where the literature had described active QCs. If a QC website was not accessible to the public, I contacted its authors or sponsoring organisations to gain access. I compared and discussed with my supervisors, Janet Harris (JH) and Sharon Mickan (SM), what we had learned from the literature and the websites that described the definitions and processes of real-world QCs.

As background information on the underlying intentions, origin and spread of QCs was scarce in published papers, I searched SOLO (Search Oxford Libraries Online) using the terms ‘quality circle’ and ‘peer review group’ for books published in countries where QC activity had been reported. QCs were introduced to PHC in the 1980s and I therefore limited my search to books published after 1980, without language restrictions, using filters such as ‘education’, ‘knowledge management’ and ‘medical care’ to identify candidate books. Since few were available online, I went to libraries to leaf through tables of contents and, in consultation with SM and JH, selected books that described the origin, definition and processes of QCs. The books I included contained information on the origin and intentions of QCs and described the general characteristics of PHC

QCs. We stopped searching when additional sources no longer provided new information and we had reached data saturation.

I considered including any paper on QCs within PHC, in any language, with qualitative or quantitative outcomes, or background information. I screened all papers identified by the search and SM, JH and GW (Geoff Wong, my main supervisor) cross-checked them to ensure they fitted the above criteria. I assessed the relevance of the papers and discussed my findings with SM, JH and GW; papers were relevant either if they contained information about the background of QCs in PHC or if they described the process in these small groups and contained data that allowed me to evaluate QCs in PHC. Based on the Cochrane Manual, I identified aspects of the latter group specific to study types and categorised the papers into randomised controlled trials, whether or not the nature of the intervention made blinding impossible, and non-randomised controlled trials, which I further grouped into controlled before-and-after studies, interrupted time series, historically controlled studies, cohort studies and case series (Green and Higgins, 2005).

I extracted the following data: authors, publication year and location, descriptions of QC background, definitions of QCs, their underlying processes, their possible effectiveness, their historical development and their spread. I used this data to generate descriptive tables that described aspects of QCs. In parallel, I iteratively generated my data extraction template in Microsoft Excel 2016. Then I charted data for each topic, one at a time, to meet my objectives.

I also searched for theories. In principle, any theory identified as explaining QCs in the literature was a candidate for the realist review, whether it came from psychology, social or economic sciences. Theories could be categorised into planned action theories of change, cognitive psychology theories of change, educational or organisational theories, and theories about QI or knowledge dissemination. When I followed key references, using the snowballing technique and software functions such as ‘similar citations’ (Booth et al., 2013), I uncovered many theories, partial theories and theoretical frameworks. To begin gathering these theories, I referred back to the

definitions of QCs. As they are groups, theories that describe groups, their dynamics and the role of the facilitator are central; as groups are embedded in a wider context, theories of organisation can help us understand them. Groups work and act, so action theories are needed to describe their action models; as groups will not act unless their members are motivated to action, I also included theories about motivation and behaviour change (Rohrbasser et al., 2013).

I identified 52 threads of theories at several levels (see Chapter Six). It was not possible to integrate all these theories into the original framework of the protocol, because some threads of theories did not fit into any category and some spanned multiple categories (Rohrbasser et al., 2013). Moreover, some theories significantly overlapped, such as the 'Adult Learning Theory' and 'Collaborative Learning'. Instead, I built a rough programme theory based on programme documentation and training material.

Programme documentation consists of written texts and illustrations that outline QC aims, objectives and roles in detail, which I gathered from the websites of professional societies across Europe or local publications. Through personal contacts in my network, I sought and was granted permission to view confidential training material for QC facilitators in different European regions, and manuals on themes for QC meetings. I drew on the training manuals, 12 text books and websites identified by the scoping review (Chapter Six) because I believed the data they contained would include the stakeholders' justifications for each step of the training. These materials were written in English or German.

I noted the possible contexts, mechanisms and outcomes of activities that offered QC participants a resource on which they may choose to act, or not. As Funnel and Rogers (2011) suggested, I began building my rough programme theory by listing the programme's intentions so I could think about its impact and outcomes. When listing the outcomes, I realised that some appeared to serve as a means of achieving the final outcomes, because some objectives had to be achieved before others. Therefore, I organised the outcomes I identified into a rough hierarchy or chain of outcomes

(Owen, 1998). During this phase, I elicited basic programme features and outcomes, but did not attempt to describe mechanisms or causal relationships. Here, my goal was to understand programme logic, its inputs and compounds and its implementation, although I did note (where possible) underlying mechanisms and threads of theories (Leeuw, 2003).

I coded the fragments of text and interpreted them (Table 4.1). In steps one to five, I extracted the data and categorised them in spreadsheets. In steps six and seven, I compared the different initial CMO configurations and synthesised them into a rough programme theory.

Table 4.1 Analysis of the data

Step	Description of the analytical step
One	I collected data on these key elements of QCs (Funnel and Rogers, 2011): ➢ Outcomes ➢ Participant characteristics: who was doing what and why? ➢ Activities: what was being done and why? ➢ Implementation context: where and how were QCs implemented? ➢ Patterns of outcomes over time or intermediate outcomes.
Two	Outcomes: each outcome, intermediate outcome or final outcome received a new code.
Three	I linked activities to outcomes, intermediate outcomes or final outcomes, and noted corresponding contextual features and mechanisms if they were mentioned, to identify the components of CMO configurations.
Four	I asked myself which activities led to what outcome, when and why (if the source mentioned context or underlying reasoning or mechanism), and built CMO configurations.
Five	I categorised and ordered CMO configurations to create the chain of outcomes and showed how CMO configurations related to each other.
Six	I compared and contrasted the patterns I found in training materials from different countries.
Seven	I formulated a rough programme theory.

Phase II – co-inquiry with experts to focus the research questions and to build a preliminary programme theory

In the co-inquiry, experts on QCs – including tutors, facilitators and participants – and stakeholders, such as CEOs of physician networks or representatives of professional bodies, became collaborators who contributed their insights and shared their knowledge with me (Pozzebon, 2017). In this project, these experts and stakeholders helped me to focus the research questions and build the preliminary programme theory through interviews and focus groups. I planned to use the preliminary programme theory to design the search strategy in Phase III. It also provided the framework to analyse data in the realist literature review (Booth, 2006).

I consulted these experts and stakeholders using semi-structured face-to-face interviews to gather qualitative data on possible research questions and the preliminary programme theory. To create a successful session, I tried to establish a positive partnership with the interviewees. The face-to-face interview allowed me to gather qualitative data at the same time, as I could read social cues (Taylor, 2005). I held focus groups to collect data from interactive discussions. Whereas in interviews interaction only takes place between the researcher and the participant, in focus groups people interact socially, ask each other questions and agree or disagree, which may reveal other dimensions and perspectives. This format highlighted attitudes and priorities in a different way and offered new frameworks of understanding (Kitzinger, 2005; Braun and Clarke, 2013). For detailed information on these two techniques, I consulted text books on qualitative research methods (Holloway, 2005; Braun and Clarke, 2013).

As I used a realist approach, I conducted interviews and held focus groups to gather data that would help me explain the programme. These interviews and focus groups supplemented the data resulting from the literature (Edwards et al., 2014). Realist interviews focus on programme theory and causation (i.e. CMO configurations) and are, therefore, interested in more than collecting participants' experiences and interpretations. The interview guide reflected this focus. The focus of

realist interviews is on gathering relevant data to build CMO configurations, i.e. threads of theories. Even a few interviewees may thus be able to provide sufficient relevant data for many CMO configurations (Manzano, 2016). At this stage of the development of the programme theory, I wanted to elicit threads of theories to build on the rough programme theory.

The content and aspects of knowledge may differ depending on professional background and role, so I wanted to include representatives of different backgrounds. The expert group included tutors who train QC facilitators, facilitators who guide small groups, and participating family physicians. Tutors train and mentor facilitators, so they knew how the programme was implemented. Participating GPs and facilitators are more likely to understand the mechanisms because they have a personal understanding of how QCs function, so they could tell me why their QCs succeeded or failed. Professional organisations and physician networks, together with health insurance companies, shape policy. As policy-making organisations affect QC outcomes, their representatives were a valuable source of information (Pawson, 1996; Smith and Elger, 2012).

In Switzerland, QC experts and the aforementioned stakeholders wanted to promote the principles of QCs and spontaneously offered to participate and collaborate. I held the interviews and focus groups at various seminars in Switzerland, and EQuiP, a European organisation of experts on QI, offered to host a focus group at their meeting in Bologna, in 2013. Participants from 14 countries supplied information about QCs in different contexts (Kirk, 2013). Together, these collaborating Swiss stakeholders and Swiss and European experts represented a range of experience across the key features of QCs (Table 4.2).

Table 4.2 Experts participating in interviews and focus groups

Experts / groups	Type of qualitative data	Date and location	Length of time
Economist, CEO of Santémed network of primary health care centres owned by health insurance company	Interview	01/05/2013 Zürich	1½ h
GP, tutor in MediX Bern, a doctor-owned network of primary health care centres	Interview	02/05/2013 Bern	1½ h
Two social scientists, representatives of the professional body, Swiss Medical Association	Interview	02/05/2013 Bern	1½ h
8 Participants, GPs, and a QC facilitator belonging to MediS Zürich, a doctor-owned network of primary health care centres	Focus group	14/05/2013 Zürich	1¼ h
GP and manager, facilitator and member of Sanacare's management board, a network of primary health care centres owned by health insurance companies	Interview	15/05/2013 Bern	1¼ h
12 Representatives of the quality committee of the Swiss Society of General Internal Medicine, GPs	Focus group	13/06/2013 Bern	1h
24 delegates of the European Society of Quality and Safety in Family Medicine, all GPs	Focus group	16/11/2013 Bologna	1h

I used the unanswered questions of the scoping review and Pawson's (2006) explanatory compendium for complex programmes to create the interview guide (Appendix 4.2). To open the conversation, I asked the experts general questions about their professional situation and their roles in, and experiences of, QCs. I introduced the subject by discussing my research and the rough programme theory I had identified in the scoping review. Then I moved to a set of semi-structured questions to elicit their views on QCs (see Appendix 4.3 for a rough translation of the interview guide). At the end of the interviews, I asked the experts about their preferred research questions.

In Switzerland, we held our conversations in Swiss German since the few French-speaking experts in the focus group could understand and interact easily in that language. Interviews were held in

quiet rooms after other meetings. Focus groups were held at the office of the MediS QC and at the office of the Quality Committee of the Swiss Society of General Internal Medicine (SSGIM) after a regular meeting. During the interviews and focus groups, I took notes and summarised the discussion afterwards. I sent the written summaries to be checked and corrected by the QC experts and stakeholders.

I conducted the focus group with EQuiP delegates in English. As this was a large group with 24 experts from 14 European countries who had a wide range of experience in QCs, I used a different set of questions to stimulate reflection. After introducing the research project, I opened the discussion by asking the experts to consider both fictitious and real QCs that either functioned well or were dysfunctional. This event was recorded on video and is publicly accessible on YouTube. A transcription was made after the discussion.

In contrast to the scoping review that provided an overview of the QC literature, the data from these interviews and focus groups required quality assessment, as I intended to build a preliminary programme theory based upon them. I used the following strategy to assess the quality of the research process and the data: first, I assessed quality through a methodological appraisal of my data collection process. I could not use a pre-formulated check-list, so I carefully documented the interview and focus-group processes, step by step (Yilmaz, 2013). Since this was a co-inquiry, I did not strictly follow standard procedures for collecting qualitative data in interviews and focus groups. I could record only the focus group with EQuiP and, since the Swiss QC experts and stakeholders served as an advisory group, I did not provide them with information or consent sheets (Holloway, 2005; Braun and Clarke, 2013; Creswell and Plano Clark, 2011). They did, however, receive written summaries of the interviews and focus groups, which they cross-checked and annotated.

Secondly, I examined the relevance and rigour of the data from the interviews and focus groups. I determined the relevance of data by looking at their applicability to specific elements of the

programme theory and deciding whether they contributed to emerging patterns of the programme theory or contradicted them. I determined the rigour of these data by considering the plausibility and coherence of the method(s) used to collect them (Pawson, 2006). I reflected critically on the assumptions that I, or the QC experts or stakeholders, might have made during the interview process. Reflexivity helped raise my awareness that our professional roles and the socio-cultural context could have influenced our interactions and the data that we generated (Pawson and Tilley, 1997). Finally, my supervisors exercised a continuous critical overview of the research process.

I applied concepts concerning the active participation of QC experts and stakeholders to appraise the methodological quality of the participative approach (Wright et al., 2013; Banks et al., 2013a). One such concept was participatory validity, that includes the notion that QC experts and stakeholders took an active part in the research. In this case, they were directly involved at several stages and they actively supported the research. Another concept was intersubjective validity, including the notion that the research was credible and meaningful to stakeholders or experts. In this case, experts actively discussed the preliminary results and emphasised their significance for the process in QCs at local and international meetings (Rohrbasser et al., 2016).

After the quality assessments, I started building the preliminary programme theory. In Phase II, I integrated the stakeholders' mental models into the rough programme theory of Phase I to create the preliminary programme theory. I prepared and explored the data, then I analysed and organised them into a format in which I could interpret them (Creswell and Plano Clark, 2011).

During this initial stage of the co-inquiry, I was still planning my research and I had yet to enrol in my DPhil programme. I started the research as a form of quality improvement initiative for existing QCs together with professional associations and colleagues who teach and train facilitators simply because we were keen to understand how we could improve the process in QCs. Therefore, no audio-recording exists of the interviews and focus groups held in Switzerland, although summarised minutes are available, as are a YouTube recording and a transcript for the EQuiP

group. As I am not an experienced transcriber, I adopted a transcription notation system appropriate to my needs and skills (Braun and Clarke, 2013). The basic rules I followed are summarised in Table 4.3.

Table 4.3 Transcription notation system

Feature	Notation and explanation of use
Speaker's identity	Anonymised by initials
Unclear words or phrases	**?**
Laughing/coughing	Noted if relevant
Pausing	…..
Non-verbal utterances	Onomatopoeia (e.g. mmm or ahh)
Punctuation	If it clarifies meaning
Background noise	If it interferes with the discussion

When I analysed the data, I transcribed and coded them, categorised them into context, mechanisms and outcomes, and then theorised and abducted to build CMO configurations as described in Table 4.1. I copied the CMO configurations from each interview to Excel sheets and used the rough programme theory as a framework to place them. They were then amalgamated into the preliminary programme theory. I cross-checked the steps during meetings with my supervisors and an example of the process can be seen in Appendix 4.4.

I expected challenges during the interviews, because QC experts or stakeholders may have wished to please the interviewer or other colleagues in the discussion, and fed them information they thought they wanted to hear, or they may have wanted to promote themselves, all of which can create social desirability bias and cause interviewees to distort the information shared (Bennett et al., 2011). The interviewer can also shape the discussion when, for example, they present threads of theories (Stocke, 2004). Asking myself the questions shown in Table 4.4 helped me to improve the interview guide by reducing the likelihood of social desirability bias (Braun and Clarke, 2013).

Table 4.4 Questions for the researcher to ask to avoid social desirability bias

Question
What am I trying to find out?
Does this question help answer my research question?
Are there problematic issues or assumptions in the questions?
How does a participant feel when they hear the question?
Is this question likely to be meaningful to my participants?

Phase III - Developing a programme theory: realist review

Realist review: developing a literature-based programme theory

The main purpose of the realist review was to gather secondary data from the literature to improve the preliminary programme theory, specifically, data from a source other than interviews. A realist review is an approach for studying the research evidence in complex interventions, such as QCs. I aimed to assess the literature and to describe how and why interventions are successful in certain contexts or why they may have no effect, using the realist logic of analysis put forward by Tilley and Pawson (1997).

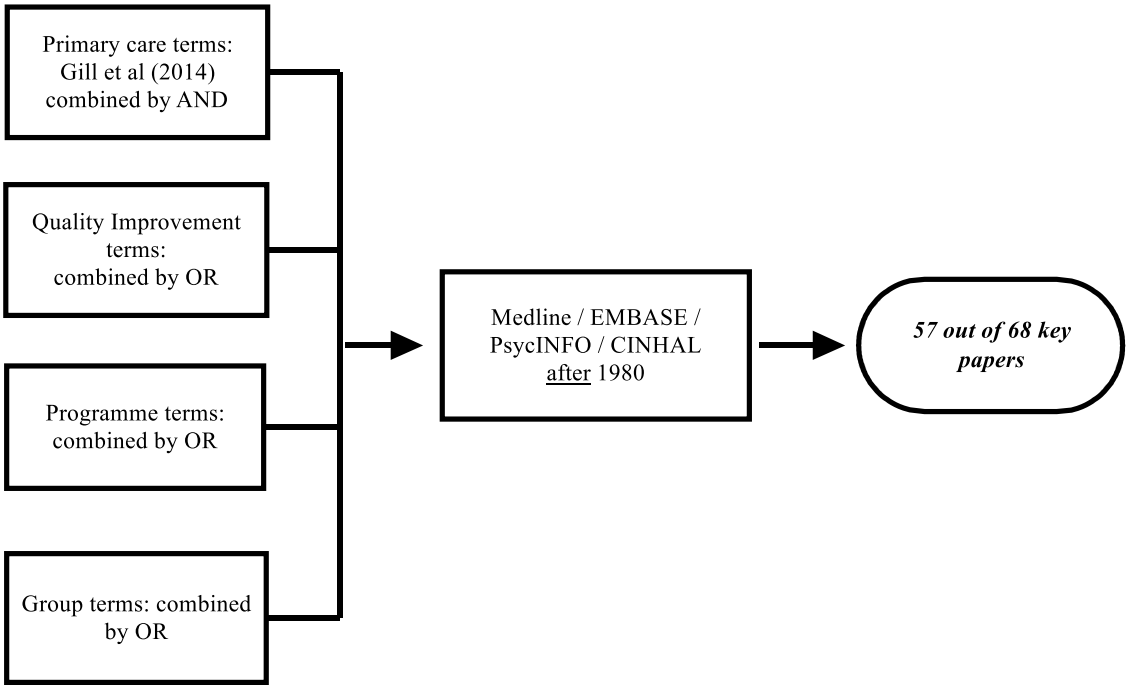
The scoping review provided background information about QCs and added search terms and combinations thereof to build a search strategy. To establish the time frame for the search, I looked at the historical development of QCs and published articles. After PBL was introduced in universities at the beginning of the 1970s, QCs emerged slowly. In 1974, at McMaster, Canada, PHC physicians met on a regular basis for CME and reflected on clinical cases (Premi, 1974). When I searched the Web of Knowledge citation map for early papers and reviews on the history of QCs, I found no references pre-dating 1974 (Premi, 1974; Rendall, 1981; Turban and Kamin, 1984; Bilawka and Craig, 2003; Schmele et al., 1991; Grol, 1994). The University of Nijmegen introduced structured small group work among family physicians in 1979, so I did not expect to find references dated earlier than 1980 (Beyer et al., 2003). I conducted the search in October 2013.

To capture later papers, I updated the search in December 2017, using the same method. The results of the updated search for the realist review appear in a separate paragraph in Chapter Eight.

An experienced librarian at the University of Oxford helped me develop the purposive comprehensive search. After our initial database searches, she thought we were most likely to find appropriate papers in Medline, EMBASE, PsycINFO and CINHAL. We searched these databases without language restrictions to capture all the literature available. Since the Netherlands and Germany, for example, were among the first to initiate QCs among family physicians, retrieving literature in different European languages was essential. We had no reason to suppose that quality differed in papers written in these languages (Egger, 2001). Geographically, the search covered QCs in European countries and Canada as well as local initiatives in the USA, Australia and New Zealand (Figure 2.2).

The complexity of QCs made it difficult to develop suitable combinations of search terms because some articles used terms that only described parts of the programme. The librarian helped me gather and combine these terms for the search (Rohrbasser et al., 2013). We added a PHC search filter to identify completed studies in primary care (Gill et al., 2014). We combined descriptive terminology, such as ‘Programme’, ‘Quality Improvement’ and ‘Group’ terms, with the PHC search filter to search the databases and created a test set out from 68 key papers from the scoping search. We then tested whether the search strategy would identify key papers (Figure 4.2). When the result was satisfactory, I performed the purposive comprehensive search in Medline, EMBASE, PsycINFO and CINHAL, without language restrictions (see Appendix 4.5).

Figure 4.2 Search strategy



Legend:
In the Boolean query string, primary care terms were followed by AND; quality improvement terms, programme terms and group terms were followed by OR.

Some full-text papers retrieved seemed closely related so I used cluster searching, a sampling strategy, to search for and complete families of papers that cover different aspects of the same research project. A family of papers may include papers of different types: background papers, papers that describe the research gap, protocols, the study itself and the quantitative and qualitative findings (Booth et al., 2013). I used different search techniques, including following citations in reference lists, Web of Science and searching by hand to find clusters or families of papers. Closely related papers (kinship papers) have contextual features and a theoretical background similar to those of the original studies.

I piloted and tested criteria for identifying and selecting relevant studies and appraising study designs with my supervisors, using a subset of relevant articles about QCs identified by the scoping review. I then applied the piloted inclusion criteria and eliminated those papers that did not meet the criteria by reading the titles and abstracts (Appendix 4.6). My inclusion criteria were:

a) The study is in the context of primary health care;
b) The study focusses on structured small group work;
c) The study uses quantitative or qualitative data to evaluate outcomes.

If the study met all three criteria listed above, I retrieved the full text. If criteria b and c were both met, but I was unsure whether the paper was about primary care, I retrieved the full text and considered it. Background papers provided me with threads of theories or other useful information. SM and JH assessed half of the retrieved papers, and I examined them all.

I appraised the quality of each paper's contribution, assessing whether a paper added relevant data. Data were relevant if they contributed to my understanding of a specific element or thread of theory in the larger programme theory and if they helped answer the research questions. I also assessed the rigour of the contribution, that is, the credibility of the research process used to generate the relevant data (Pawson, 2006; Lewin et al., 2015). The assessment of rigour in a realist review is not, however, based solely on judgements about the methods used to generate relevant data but should also take place at the level of the theory itself. Ideally, theories with good explanatory powers should be based on coherent arguments that are supported by trustworthy data. I therefore assessed the rigour of a (thread of) theory by judging its explanatory powers – a process known as inference to best explanation. Three criteria are used in the judgment process for an ideal theory: consilience, simplicity and analogy (see Chapter Three for more details).

I used the preliminary programme theory from Phase II to build a framework for data extraction. I piloted and tested this framework for extracting data on the set of 68 relevant articles about QCs that I identified in the scoping review. I extracted data as text that I interpreted as describing activities, mechanisms, context and related outcomes for each study into Microsoft Excel. If the authors discussed why QCs succeeded or failed, I included this discussion as data. Where studies explicitly used a programme theory, I noted the theory. My supervisors revisited the studies and reviewed my data extraction to ensure that the level of detail extracted was sufficient (see Appendix 4.7 for a sample data extraction). The following data were extracted for each paper:

- Author, Year
- Country
- Study design
- Setting
- Number of participants in the group and their professional backgrounds
- QC frequency
- Participation: voluntary, mandatory
- Financial compensation or other links to mandatory QC
- Group dynamics
- Didactic and QI technique
- Facilitator's role
- Facilitator skills and training
- Profession of facilitator
- Autonomy regarding the process
- Autonomy regarding choice of issue
- Written summary or minutes
- Other contextual features
- Purpose of the QC
- Evaluation purpose
- Evaluation tool
- Outcome, results, measures
- Mechanisms or theories.

When I looked at how and where in the paper authors reported theory, I was able to recognise mechanisms that were sometimes implied rather than explicit in specific sections of the publication, as shown in Table 4.5. An example is given in Appendix 4.8.

Table 4.5 Search for theories in primary literature

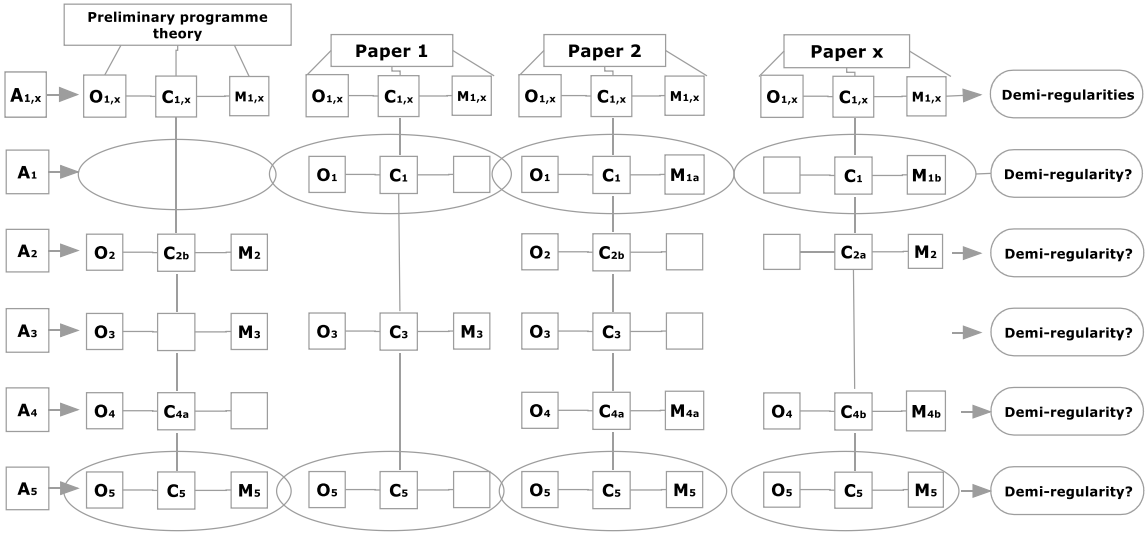
Use of theory	**Where to find it**
Was a theory used as a design for the intervention?	Usually in the Introduction.
Was the intervention delivered according to the theory?	Usually in the Discussion.
Were deviations from the original theory noted and explained?	Usually in the Discussion.
Were the results analysed according to the original or refined theory?	Usually in the Results or Discussion.

To analyse the data, I followed the same analytical processes as set out in Table 4.1, using spreadsheets to identify relationships between activities and CMO configurations and leaving spaces for missing information about components within a configuration. I used different colours to identify the various CMO configurations (see Appendix 4.9 for an example). The spreadsheets were discussed at length and checked in two meetings with my supervisors.

In the next stage of the analysis, I gathered families of papers and grouped kinship papers by similar contextual features and theoretical background. When papers seemed closely related, I sorted them by authorship or research groups to ascertain whether they provided more data about single QC examples. I completed groups of kinship papers and families of papers by conducting

cluster searches for supplementary data about similar circumstances or single QC examples that may have been published elsewhere. I extracted their data, analysed each paper and discussed newly accessed papers with my supervisors. In the spreadsheets, I colour-coded the text related to activities, context, mechanism and associated outcomes that I identified in each paper. I listed and grouped the papers' CMO configurations based on type of kinship, within the framework of the preliminary programme theory. The colour-coded text and numbers made the patterns of CMO configurations visible. Configurations with missing C, M or O were also added to the framework. In an iterative process, moving between the papers, their data and the framework, I arranged and rearranged the CMO configurations and built semi-predictable patterns of intermediate or final outcomes (demi-regularities) to develop the refined programme theory (see Figure 4.3).

Figure 4.3 CMO configurations across studies and demi-regularities



Legend
A: Activity. Activities 1 to 5.
O: Outcome. Outcomes 1 to 5.
C: Context. Contexts 1 to 5, although some may be missing.
M: Mechanism. Mechanisms at different levels of activity; the same outcome may have several mechanisms; if no mechanism was mentioned, the square is blank.
Comparing groups of CMOs across studies may create a demi-regularity.
The marked demi-regularities are examples of how I built CMO configurations across the papers.

The preliminary programme theory formed the framework for refining and expanding the programme theory, and rendering its steps more precisely. I converted the CMO-configurations into 'if … then … because' statements and used them to develop the programme theory. For instance, *if practitioners present their own clinical cases followed by case discussions .... in a safe environment (C1) … effectively facilitated (C2), then they become active (O) because they feel involved (M1) …. because people trust their colleagues and dare to tell them about their performance (M2)*. As Leeuw (2003), Funnel and Rogers (2011) suggest, I arranged the conditional clauses sequentially, in the same order the programme is intended to work. I expressed the CMO configurations in words and sorted them according to the intermediate and final outcomes that unfolded in the QC programme. To do this, I entered the preliminary programme theory into an Excel sheet, using conditional clauses to delineate its CMO configurations. Data (text bits) from different sources were aligned side-by-side with the steps of the programme theory. CMO configurations that appeared to conform to those of the preliminary programme theory were added at the same level. I used these additional data to refine and corroborate the original statement. If papers added new CMO configurations, I added a corresponding conditional clause to the programme theory. I continually checked the process and data content with my supervisors.

There are at least four contextual layers relevant to the programme theory (Pawson 2006), and I considered all of them when working on the wording for the refined programme theory. The level of official bodies, e.g. the Federal Office of Public Health or similar governmental organisation, builds the wider infra-structural setting. The institutional setting is the organisation within which the participants work, learn and teach. The contextual layer of the group is where interpersonal relationships occur; for instance, facilitation concerns the level of interpersonal relationships. Finally, there is the level of the individuals with their capabilities and motivations, for instance, the individual capacity of key figures.

Refining the literature-based programme theory

I held focus groups and conducted interviews with the above-mentioned QC experts and stakeholders and also included other health-care professionals to collect the data and refine the literature-based programme theory. At this stage, the health-care professionals and stakeholders provided me with personal data about QCs, as participants in a study, which required ethical approval. I therefore refer to them as 'participants' in this section.

I held six interviews and ran two focus groups between March and May 2015. For logistical reasons, I conducted five interviews, then two focus groups and then one more interview. In March 2015, I initially met the Swiss participants and held interviews. Then, in April 2015, the EQuiP meeting on QCs took place, where I held the focus groups with participants from Switzerland and various other European countries. On 5 May 2015, I conducted the final interview with a Swiss participant. To provide clarity for the reader, I now separate the interviews with Swiss participants from the focus groups held at the EQuiP meeting. Participant characteristics are summarised in Table 4.6.

Table 4.6 Participants in interviews and focus groups, refining the literature-based programme theory

Participants: number of people	Type of qualitative data	Date and location	Length of time
GP and manager, CEO of Santémed network of primary health care centres owned by health insurance company	Interview	18/03/2015 Wil	23'26''
GP, tutor in MediX Bern, a doctor-owned network of primary health care centres in Bern	Interview	19/03/2015 Bern	64'21''
GP and manager, facilitator and member of Sanacare's management board, a network of primary health care centres owned by health insurance companies	Interview	25/03/2015 Bern	42'40''
Two social scientists, representatives of the professional body Swiss Association of Medicine	Interview	02/04/2015 Bern	72'47''
GP, facilitator of a QC belonging to MediS Zürich, a doctor-owned network of primary health care centres, Professor at the Institute of General Practice in Zürich	Interview	02/04/2015 Zurich	61'26''
Group of 21 GPs at the open meeting in Fischingen on QCs organized by EQuiP	Focus group	24/04/2015 Fischingen	90'
Group of 12 GPs at the open meeting in Fischingen on QCs organized by EQuiP	Focus group	25/04/2015 Fischingen	90'
GP, executive for General Practice at the hospital in Aarau	Interview	08/05/2015 Aarau	37'17''

In March, April and May 2015, I met with Swiss participants to interview them about the preliminary chain of CMO configurations that represented the programme theory I had found in the literature. I intended to test each CMO configuration for its configuration, interpretation and underlying mechanisms and also wanted to test the position of CMO configurations in relation to the programme theory. During the interviews, participants refined the language when CMO configurations needed clearer descriptions (Manzano, 2016). Participants were actively involved in analysing the data and developing the programme theory.

To plan and hold the interviews with the Swiss participants, I first sent potential participants a request for an interview through a standardised email, as recommended in the Central University

Research Ethics Committee (CUREC) guidelines. The email gave the name of the study, details of the researcher, a brief rationale for the study (including its purpose) and the reason I had invited the individual to take part in our research. It also explained what the participant would be asked to do, where the interview would be held and how long it would take. I attached the CUREC-approved information and consent sheet to the email (Appendix 4.10). In line with the participative approach, I conducted the interviews with the QC experts and stakeholders who had advised me during the co-inquiry phase because I wanted to give them the opportunity to remain actively involved. There were a few modifications to those participating: the CEO of the Santémed network of health-care centres had left the organisation but his successor decided to respond as a participant. After consulting his group, the MediS facilitator chose to respond to interview questions alone, due to time constraints.

To introduce the interview, I updated participants on the progress of my research. Then, in plain language, I explained the programme theory that had originated in the literature. I avoided unfamiliar academic expressions such as 'programme theory' and 'CMO configurations', and used conditional clauses to describe QCs. I asked participants whether they agreed with the statements or not, and what they thought the underlying reasoning was for what happens in QCs. I held the interviews in Swiss German and offered participants provisional statements, including probing questions (see Appendix 4.11 for an example of the description of the programme). Interviews took between 30 and 60 minutes and were recorded with a Microspot digital voice recorder placed on the table. In order to avoid social desirability bias and to obtain disconfirming data about CMO configurations, I formulated the questions neutrally and offered contradictory options that could be discussed. Students at the College of Education in St. Gallen, Switzerland, transcribed the interviews. I used the same data extraction processes as described in Table 4.3.

In April 2015, EQuiP organised an open meeting in Fischingen, Switzerland, and invited European and Swiss QC experts, stakeholders and interested participants to attend talks and

workshops (Kirk, 2016). Together with SM and JH, I conducted two focus-group sessions to discuss CMO configurations of the literature-based programme theory. Information about the focus groups was sent in advance as part of the conference programme. Further information about the purpose of each session was handed out to interested participants during the meeting. Attendees did not have to sign up for the sessions. Eleven members of the SSGIM quality committee decided to participate in the focus groups in Fischingen and an additional 22 Swiss and European participants joined.

We held the two focus-group sessions in English. JH led the session, SM took notes on the group process and I observed the group and took minutes. At the beginning of sessions, we handed out written information about the programme theory, phrased as conditional clauses without suggesting mechanisms. The participants read the statements and decided whether they agreed, partially agreed or fully agreed with the statements. JH asked them to explain why parts of the programme would or would not work. Before discussing each proposition, JH summarised the procedure for disagreement, partial agreement and full agreement with statements. Participants were actively encouraged to suggest competing explanations for how and why QCs do or do not function well in certain contexts. JH asked complementary probing questions at different stages, such as asking whether these preliminary ideas reflected the participants' experiences, or whether they had other ideas about how QCs work and why. See Appendix 4.12 for the question sheet. After each focus group, I held a debriefing meeting with JH and SM, where I took notes. To complete the data collection, I wrote up a summary, drawn from JH or SM's notes, as written on flip charts during the focus groups, and my own notes from the debriefing sessions.

I had invited a wide range of Swiss and European QC experts, participants and facilitators to critique the literature-based programme theory. The participants were enthusiastic but also critical and very few registered participants failed to attend. I applied the concepts of data saturation and stopped collecting data when additional information added no further relevant evidence. As the

emphasis of the interviews and focus groups was on programme theory development, the important factor was not the number of interviews or focus groups but, rather, the events and processes which participants recounted and provided information on (Manzano, 2016). It was sufficient to carefully select a limited number of people who participated in interviews and focus groups to represent and account for QCs in different contexts.

To assess the quality of the research process and the data, I used the principle described in the section on Phase II. In addition, triangulation helped me balance biases such as social desirability, interpretive or selection bias. Gathering data from the range of QC participants, facilitators, tutors, organisers and managers made it less likely that I would adhere to preconceived notions. Furthermore, the use of different types of data, such as interview and literature-based data, forced me to consider different perspectives.

When analysing the interviews and focus groups, I had to distinguish between the statements about how stakeholders thought the programme should operate, and those about how it actually did operate (Pawson, 1996; Funnel and Rogers, 2011; Manzano, 2016). Participants deliberated on the CMO configurations, helped reword demi-regularities and checked the order of intermediate outcomes to secure the final outcomes of QCs. See Table 4.7 for a description of the analytical steps.

Table 4.7 Analytic steps including participants' critiques

Step	Description of the analytical steps
1	I coded CMO configurations based on each participant's feedback / comments and examined: ➢ Whether the participant agreed ➢ Whether the underlying reasoning was in line with the mechanism mentioned in the configuration ➢ Whether the participant disagreed ➢ Whether the participant offered other CMO configurations ➢ Whether the participant needed clarification about wording ➢ Whether the participant could offer alternative formulations.
2	I included new CMO configurations in the programme theory after discussion of the details with my supervisors.

Phase IV – Consolidation of the programme theory

Interviews with stakeholders across Europe

To consolidate the programme theory, I interviewed participants from different European countries and explored the theory's different contextual layers (Manzano, 2016). I wanted to learn how these layers shape the programme, so I set out to gather different perspectives from representatives across Europe with particular attention to the level of official bodies and institutional settings because this information was scarce in the literature. Interviewing a range of people in different countries allowed me to triangulate data to consolidate or refute threads of the programme theory.

Face-to-face interviews have long been the most common interview technique in qualitative research, and can be both rigorous and valid (McCoyd and Kerson, 2006) but time and financial constraints and geographical distance may make it difficult to hold conventional face-to-face interviews. Online interviewing is increasingly used to interview informants who are geographically dispersed (Cater, 2011) and the use of new online techniques, such as YouTube Live, has become essential (Sedgwick and Spiers, 2009). I used YouTube Live, a video conferencing service from the US company Google, that provides a live broadcast of a video session as an accessible video stream. This technique allowed me to interview colleagues in the comfort of their own space providing synchronous visual interaction between the participant and me (Hanna, 2012). The video sessions are stored in the linked YouTube channel after transmission, and access is restricted to the participant and the interviewer. A drawback was that both the participants and I had to use new software that caused technical difficulties both in the preparation for and during the interviews (Cooper, 2009).

To learn more about the layers of contexts, I chose representatives from countries with different systems of PHC provision, assuming that the context level of official bodies and institutional settings are relevant to the QC programme. I therefore included 5 EQuiP representatives from five

different countries, selected because they had specialist knowledge at all levels and could provide valuable insights into their country's QCs. They still participate actively in QCs and I expected them to be able to explain why QCs fail or succeed in particular contexts. Some also work as tutors and know how and why the programme is implemented in their region. They supervise groups and meet a range of facilitators, and can therefore judge immediate effects and outcomes. Finally, they are all involved in national primary health-care QI and understand the positions of policy-makers. Since it would have been too expensive and time consuming to interview QC participants, facilitators and policy-makers in each of these countries, and because my language skills are limited, I chose individual experts who could communicate in English (Table 4.8).

Table 4.8 Participants in interviews designed to consolidate the programme theory

Participant's characteristics	**Country**	**Date of interview**	**Length of interview**
GP in a rural practice, teacher at the University of Ghent	Belgium	07/02/2018	49'
GP in a rural practice, small group educator for 18 years	Ireland	09/02/2018	64'
Certified facilitator in GP vocational training, active in quality improvement and patient safety	Norway	08/02/2018	71'
GP working in an urban area, facilitating a QC, researcher	France	16/02/2018	79'
GP in a rural practice, teacher for GP vocational training	Croatia	07/12/2018	53'

I included a representative from Belgium in the sample because I had heard that Belgian health insurance companies have little faith in QCs and their effect on QI, despite a high participation rate. Belgium's health-care system is funded principally through social insurance contributions on a fee-for-service basis, and these fees support doctors. The mandatory insurance can be replaced by a voluntary health insurance. Self-employed doctors provide the majority of outpatient services. GPs in Belgium are paid a small capitation fee but are not gatekeepers who refer patients to specialists.

I chose a representative from France because QCs developed quickly there; there were ‘no QCs in existence’ in 2000, but by 2015 at least 10% of GPs participated in QCs (Rohrbasser et al., 2019). I needed information about the QCs that were prospering and the features that aided their growth. Health insurance is compulsory in France. Depending on the occupational sector, workers pay a small proportion of their salary for their health insurance, with the employer paying the remainder of the cost; the amount depends on the worker’s income. Immigrants and the unemployed have separate health insurance. As in Belgium, GPs in France are principally remunerated by a fee-for-service system. GPs are gatekeepers, except to paediatricians, gynaecologists and ophthalmologists.

Ireland has a long tradition with CME groups (QCs) and high participation rates. The Health Service Executive (HSE) funds the CME small-group network but the Irish College of General Practice (ICGP) has a governance role. The ICGP receives funds from the HSE to cover the majority of costs for tutors and group leaders, and some of the funds for group leaders come directly from the ICGP. At present, most of the funding is from the HSE. I included an Irish representative because of their unique organisation of QCs and high participation rate in their groups. Ireland has a centrally organised PHC system which has a public and a private branch. According to the Economic and Social Research Institute (ERSI), more people have opted for the public health care system since the financial crisis. In 2015, Ireland’s doctors were paid primarily through capitation fees. Fee-for-service remuneration from private health-care insurance dropped to 15% of doctors’ income. GPs in Ireland are gatekeepers, with exceptions similar to France.

I chose a representative from Norway because GPs play an unusual role there. Norway’s health-care system is mainly public; insurance is covered by a percentage of income and tax subsidies. Almost everyone is registered with a primary care physician. The GP is the first point of contact for the patients and is a gatekeeper. Only 10% of GPs are directly employed by municipalities;

90% are self-employed and are licensed by their municipality, which guarantees them a basic salary. In addition, there are capitation fees for each GP.

I recruited a participant from Croatia because I had heard through personal contacts that GPs there experience difficulties in establishing motivated groups. I trained their first facilitators in 2016, and they are now trying to form a fostering organisation. All Croatian citizens are covered by the state health insurance fund. The health-care system is public and paid for by social security contributions. Despite financial constraints, the health-care system has expanded and covers the whole country, providing primary health care and specialised hospital-based care. GPs act as gatekeepers with certain exceptions, as in France. They are remunerated through a combination of salary, capitation fees and fee-for-service systems.

When I planned and conducted these interviews, I adhered to the process described in Phase III. The standardised emails contained the name of the study, details on the researcher, a brief rationale for the study including its purpose, and the reason why I had invited the individual to participate. It included an infographic and summary of the programme theory (Appendix 4.12 introductory material). To avoid technical difficulties, we met briefly online so that I could answer questions or resolve problems with the equipment. The dates and times of interviews were mutually agreed.

Before I began each interview, I told the participant about the status of the research. I started with questions about local QC development and its main purposes. Participants had the opportunity to talk about their QCs and become personally involved in the subject matter. I built on the interview guide on key elements of the programme theory from earlier interviews and added questions about how the institutional setting and official bodies may affect QCs (Appendix 4.13). These questions guided the interview but I did not explicitly pose every question to each participant. I was most interested in eliciting personal experiences and examples, especially on current challenges caused at the level of the official body or the institution or the support these

organisational levels may have provided. The interviews were conducted via YouTube Live and lasted 60 to 90 minutes.

Social desirability can influence the material shared by participants in face-to-face interviews. I adhered to the practices I described in Table 4.4, and also offered a 'disagree' option to questions. I tried to keep the questions jargon-free and non-threatening, framing them obliquely rather than directly; for example, I used phrases such as, 'Some people I have interviewed have told me that ....' to introduce steps of the programme theory in a non-threatening manner.

Interviews were transcribed as described in Table 4.3. I summarised the notes I took during the interviews and could revisit the transcripts and the videos. Participants provided data that I used to confirm, reject or refine the steps within the programme theory. Understanding their reasoning helped me identify possible mechanisms and contextual features that might enable or disable these mechanisms. I checked the chain of outcomes and made corrections where needed. Participants suggested theories that they thought they would explain the programme theory or parts of it, and these contributions were integrated into the programme theory.

Identifying and exploring the relationship of formal theories and programme theory

In this final step, I compared and contrasted the programme theory with formal theories to explain the intermediate and final outcomes in QCs in the discussion section (Chapter Ten). Formal theories operate across different domains and disciplines. For instance, the 'Social Cognitive Theory' has been examined and verified in different disciplines and across different populations (Van Zundert et al., 2009; Ratten and Ratten, 2007; Bandura, 2001). Formal theories may capture a programme theory's underlying mechanisms and explain how its threads fit into patterns across different disciplines. Programme theories that are based on formal theories may also provide better explanations of phenomena than those that are not (Wong et al., 2017). My programme theory was developed to understand how QCs achieve their outcomes and under what contextual

features they thrive. At this point, I explored the programme theory and compared and contrasted it with formal theories that could explain as many as possible of the CMO configurations more generally and make sense of the patterns I found (Wong et al., 2013). I had three sources for candidate formal theories: theories found during the scoping review when we developed the protocol for the realist review (Rohrbasser et al., 2013); theories found in the papers identified in the realist review; and theories described by interviewees.

I synthesised the findings at two levels. First, I aligned threads of theories from different sources, matching them to the consolidated programme theory so I could explain demi-regularities and the chain of outcome. Secondly, I studied and analysed the relationship between the consolidated programme theory on QCs and relevant existing theories. Theories on structured group work in settings other than health care were relevant (e.g. business or education). So were theories that described concepts similar to QCs, such as theories about groups or about knowledge creation. Ideal theories have a high level of explanatory coherence, so an ideal theory about QCs would describe and explain in a simple way how QCs achieve their outcomes and would show similarities with theories already known.

Chapter Five: Ethical considerations

In this chapter, I describe how I applied the principles of usefulness, feasibility, accuracy and evaluation standards. I adopted a participatory research approach, fostering a climate of mutual respect and continuous self-reflection with my collaborators throughout the process. The study fulfilled the requirements of the Central University Research Ethics Committee (CUREC) guidelines and was formally approved on 7th January 2015.

Ethical principles in evaluation

This research required ethical approval because it involves participants whose rights must be protected. Involvement with QCs was classed as service evaluation in Switzerland because it falls within clinical governance and QI; this seemed consistent with international interpretations. The ethics committee guidelines suggested following the general standard principles of programme evaluation (Yarbrough et al., 2010). A programme consists of regular activities or interventions and evaluation concerns the systematic exploration of the programme, which should meet scientific standards. I used the consensus statements developed by Yarbrough et al. (2010) to guide my study. First, I clarified the usefulness of the project through consulting stakeholders. I then assessed the feasibility of this investigation as many factors, such as economics, cultural values or group interests, could have hindered the planned evaluation. For this reason, I started with a scoping review and formal and informal discussions with stakeholders, along with advice from my supervisors, who are experienced academics. Once we agreed on the feasibility of the project, I planned the research project in collaboration with the stakeholders. To ensure accuracy, I used sound theory, methods and reasoning in my research to avoid distortions and inconsistencies. I fully documented the process and its detailed steps and selected sufficient data to permit the description, understanding and explanation of new knowledge, without being prejudiced. I investigated systematically how, for whom and under which circumstances the QC programme functions well. In the future, this may offer a set of tools for organisational

development and for the purposes of decision-making to improve the QC programme (Yarbrough et al., 2010; Bislimi et al., 2015).

Ethical considerations concerning the participatory approach

The International Collaboration for Participatory Health Research outlines several principles to which researchers who take a participative approach should adhere (Banks et al., 2013b). First, I ensured mutual respect and responsiveness to the needs of participants by seeking diverse perspectives and engaging continually in self-reflection. I was prepared to listen to the opinions and thoughts of others and integrate them into the research project and encouraged participants to become personally involved. I ensured that participants knew that this exchange of knowledge was mutually beneficial and reciprocal (Banks and Manners, 2012; Banks et al., 2013a). Since the status and power of participants was bound to influence their contributions, I had to be reflective and reflexive to ensure an ethically sound process and to avoid distortion of results (Guillemin and Gillam, 2004). As the professional community of health-care professionals interested in QC is small, it was difficult to preserve the anonymity of participants: professionals working in the same network knew each other, so even those who wished to remain anonymous could be exposed by revealing their role and expertise. I was, therefore, very careful when I was trusted with personal statements or information when collecting data. I avoided using sensitive information and, when there was any question, acted conservatively to protect confidentiality (Flicker et al., 2007).

Ethics approval

I finished the co-inquiry in November 2013. After I completed the research questions and accompanying methods in June 2014, the study went through the CUREC application process and was approved on 7th January 2015 for 48 months. The study fulfilled the requirements of informed consent, handling of personal information and confidentiality. On 30th March 2016, an amendment granted me permission to use YouTube Live to interview European experts.

Chapter Six: Results of Phase I – scoping search

This chapter provides an overview of the results of the scoping search that informed Chapter Two's discussion of the historical background and efficiency of QCs and the gaps in our knowledge. I also describe the document flow, the search for theories and the development of my rough programme theory.

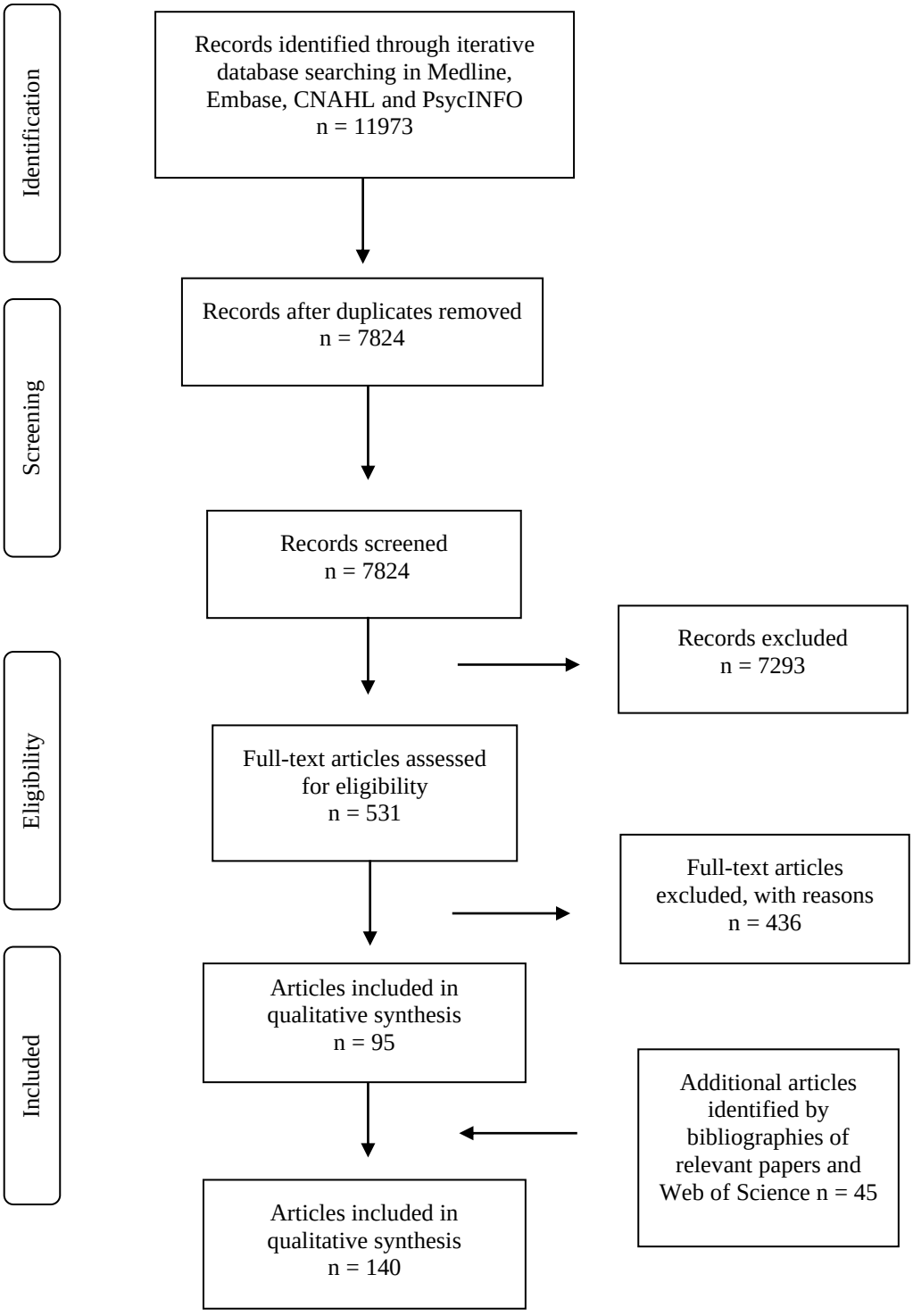
As an overview, I provide a short narrative of the programme theory as it emerged during my reading and analysis of the books and training material from my scoping search. Quality circles are small groups across Europe of 6–12 health-care professionals who meet regularly to reflect on and improve their standard practice. They are based on the two fundamental concepts that shaped them from the beginning: the cycle of learning or QI, and the social context in which the group functions. QCs help participants to link evidence to everyday practice and to feel secure in their professional roles. They use didactic method, such as brain-storming and reflective thinking, and QI techniques such as exchanging experiences, audit and feedback to identify gaps in knowledge. A skilled facilitator leads the group through the cycle of learning or QI.

Document flow

The following flow diagram (Figure 6.1) shows the number of papers included and excluded at each stage. My iterative searches returned 140 papers. Of these, 82 background papers, 21 systematic reviews, 14 randomised controlled trials, 11 non-randomised controlled studies, 11 qualitative studies and one mixed-methods study were relevant and eligible for inclusion (Appendices 6.1 and 6.2). The systematic reviews, randomised controlled trials, cohort and controlled before-and-after studies described and evaluated QC processes or techniques. Qualitative studies and background papers described QC processes and additional benefits. Background papers, books and web resources provided complementary information on the origin, definition and spread of QCs (Rohrbasser et al., 2018). I identified eight websites in countries

where the literature described active QCs (Bundesvereinigung, 2013; Garbutt et al., 2015; Kirk, 2015; Hockl, 2016; Finnegan, 2017; Dressarts and Martin, 2017; Rohrbasser, 2017; Arvidsson and Elmroth, 2016; Rial, 2017; Elmslie et al., 2017). To supplement the information I retrieved from the literature, I used 12 textbooks (Ross and Ross, 1982; Ishikawa, 1985; Lawrence and Schofield, 1993; Gerlach and Bahrs, 1994; Bahrs et al., 1995; Grol and Lawrence, 1995; Marinker, 1995; Fraser et al., 1999; Tross, 2003; Elwyn et al., 2004; Saltman et al., 2005; Sommers and Launer, 2013). The results of this scoping review serve as an overview of the literature (Chapter Two).

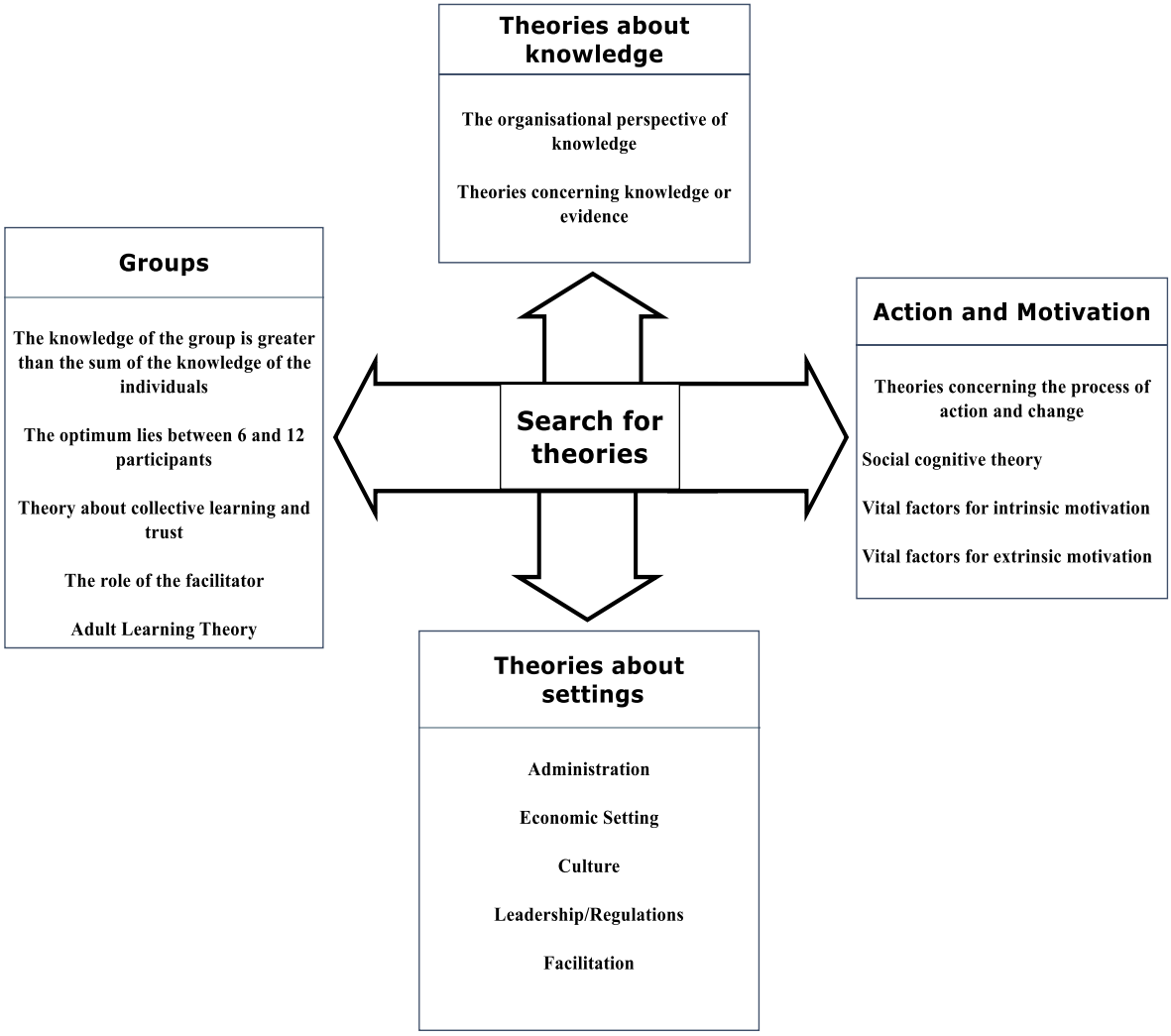
Figure 6.1 Paper-flow diagram for scoping review



Theories

I also searched for theories in the scoping review: Figure 6.2 gives an overview of the theories most often cited in the literature, discovered by iterative searches for underlying theories (Rohrbasser et al., 2013). I have listed the theories in Appendix 6.3.

Figure 6.2 Overview of theories found in the scoping search

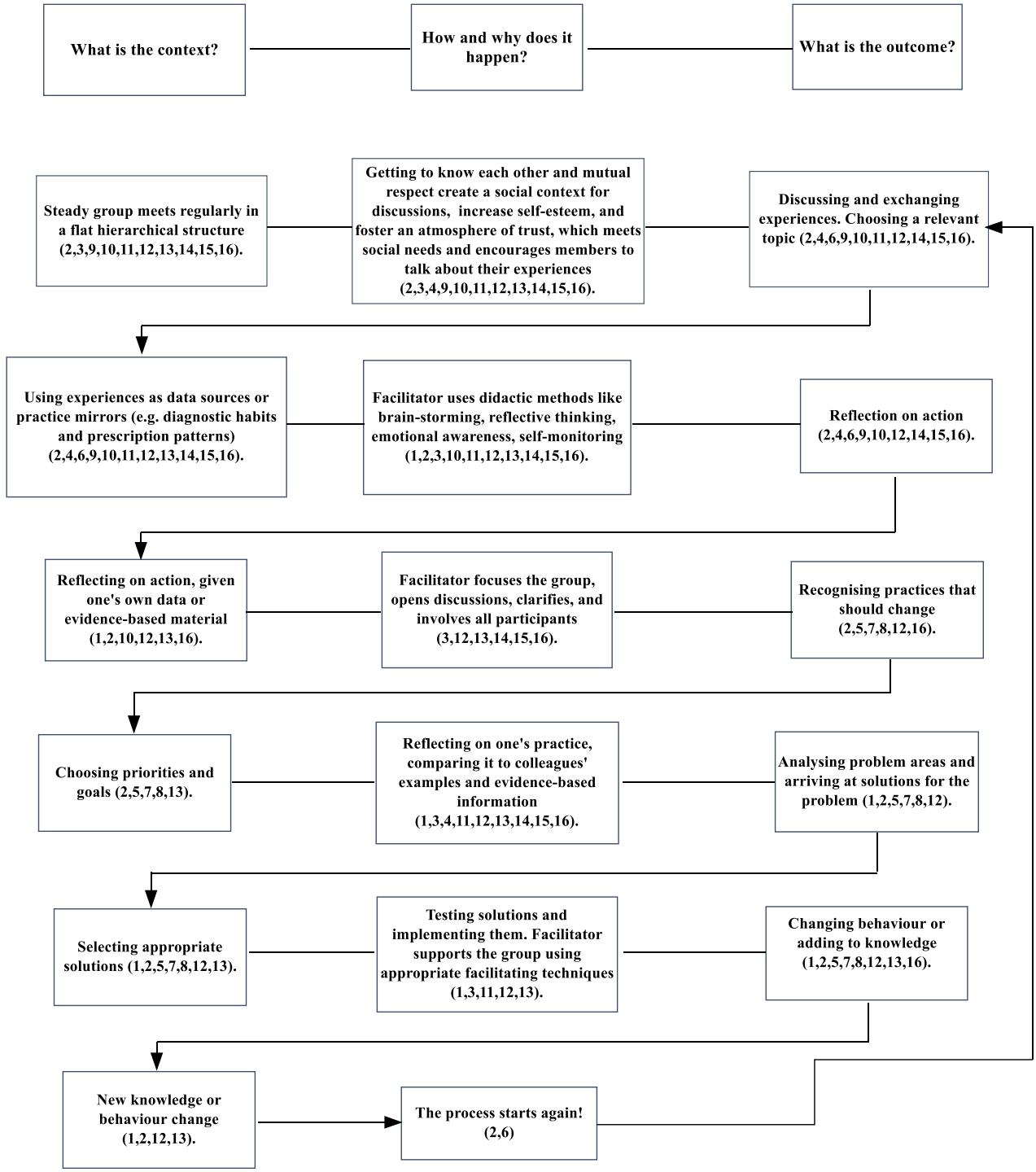


Building a rough programme theory

From the scoping review, I set out to produce a rough programme theory, using a range of sources, as detailed in Figure 6.3. From these sources, I described and defined the concepts concerning QCs by reading and analysing the books and training material described in my scoping review and developed the following rough programme theory in consultation with my supervisors (SM, JH):

A quality circle is a group of people who voluntarily and regularly meet to reflect on and improve their standard practice, increase their knowledge, augment their skills and improve their working conditions. In a QC, members critically evaluate each other's practice in a supportive social context, based on shared experiences and on the data that they or physician networks, in collaboration with health insurance companies, have collected on their diagnostic or prescription patterns. The participants' social needs are met in an environment of mutual trust and safety. QCs are non-hierarchical, and members are accorded equal respect, which increases their self-esteem. Facilitators focus members on the topic at hand and actively use methods such as brainstorming and buzz grouping, free discussion or role play, leading the group through the cycle of learning or QI. QCs usually begin with an exchange of experiences which flows into a reflection on action. Throughout this process, members identify knowledge gaps and problems. During their meetings, members discuss problem areas and propose appropriate solutions, often by comparing their results with those of their colleagues. The facilitators use a variety of techniques to help members learn and change their behaviour. New habits or new knowledge become part of the ongoing discussion, and the process can start again if members want to revisit a topic. The sequence of the chain of outcomes is shown in Figure 6.3.

Figure 6.3 Rough programme theory and sources of information (sources in brackets)



List of sources:

1. Grol, R., Lawrence, M., ed.1995. *Quality Improvement by Peer Review*. Oxford: Oxford University Press.
2. Bahrs, O., Gerlach, F.M., Szecsenyi, J., ed. 1995. *Ärztliche Qualitätszirkel: Leitfaden für den niedergelassenen Arzt*. 2 ed. Köln: Deutscher Ärzteverlag.

3. Elwyn, G., Greenhalg, T., Macfarlane F., ed. 2004. *Groups a guide to small group work in healthcare, management, education and research*. Radcliffe Medical Press.
4. Sommers, L.S., Launer, J., ed. 2013. *Clinical uncertainty in primary care: the challenge of collaborative engagement*. London: Springer.
5. Fraser, R., Mayur, L., Baker, R., ed. 1999. *Evidence-Based Audit in General Practice Science*, Edinburgh: Elsevier Science
6. Gerlach, F.M., Bahrs, O., ed. 1994. *Qualitätssicherung durch hausärztliche Qualitätszirkel: Strategien zur Etablierung*. Berlin: Ullstein Mosby.
7. Lawrence, M., Schofield, T. 1993. *Medical Audit in Primary Health Care*. Oxford University Press.
8. Marinker, M., ed. 1995. *Medical Audit and General Practice*, 2nd edition. London: BMJ Publishing Group.
9. Tross, O., ed. 2003. *Qualitätszirkel als Form der Arbeitsorganisation: Planung und Gestaltung von Qualitätszirkeln als Variante der Teamarbeit in Unternehmen*. München: Verlag für Akademische Texte.
10. Elmslie, T. et al. 2017. *Practice Based Small Group Learning (PBSGL)* Hamilton: McMaster. [Accessed 1st October2017]. Available from: https://www.fmpe.org/
11. (SFMG) SFdMG. 2017. *Les groups de pairs*. Paris: SGMF [Accessed 1st October 2017]. Available from: http://www.sfmg.org/groupe_de_pairs/
12. (SSIM) SSoGIM. 2017. *Qualitätszirkel*. Bern: SSIM [cited 2017 01.10.2017]. Available from: https://www.sgaim.ch/de/qualitaet/qualitaet-in-der-praxis/qualitaetszirkel.html
13. Kassenärztliche Bundesvereinigung. 2013. *Qualitätszirkel* [Accessed 5th May2016]. Available from: http://www.kbv.de/themen/qualitaetszirkel.html
14. (ICPC) ICoGP. 2017. *CME Small Group Meetings*. Dublin: ICPC [Accessed 1st October 2017]. Available from: https://www.icgp.ie/go/courses/cme_small_group_meetings
15. Rial, J. 2017. *Practice Based Small Group Learning (PBSGL)*. Southampton GPEU [Accessed 1st October 2017]. Available from: https://www.pbsgl.co.uk/
16. Hockl, W. 2016. *Qualitätszirkel* [Accessed 1st October 2017]. Available from: https://oegam.at/qualitaetssicherung-und-qualitaetszirkel

Chapter Seven: Results of Phase II - focussing the research questions and developing a preliminary programme theory using data from the co-inquiry with stakeholders

This chapter summarises stakeholder interests and preferences regarding the direction of research. Co-inquiry, in the form of one-on-one discussions and group meetings, helped me select and narrow my research questions and describe the stakeholders' mental model of QCs, which then became my preliminary programme theory. Semi-structured interviews and focus groups revealed that both the stakeholders and the study authors had the same relevant questions: both wanted to identify the common components of successful groups and the contextual features that improve the group process, at both institutional and policy levels.

As an overview, I summarise and outline here the mental model as it emerged from the co-inquiry with stakeholders: GPs meet in QCs because they want to discuss the problems they encounter daily and exchange ideas. National regulations, or contracts with health insurance companies that require GPs to continually check and improve their quality of work, may motivate participation in QCs. Professional or physician network organisations that organise QCs should provide administrative support, protected time and equipment. Groups should be limited to 12–15 people as communication grows difficult in larger groups. Facilitators help to create a safe environment so that participants can interact authentically. A supportive atmosphere, a sense of collegiality and mutual trust are prerequisites for participants to discuss their problems and failures openly using their own clinical cases as examples. Facilitators create the basis for a learning atmosphere in which participants can reflect on their current practice and compare it with educational, evidence-based material (EBM) such as guidelines. Autonomy is key; the groups choose a topic about which they want to learn more or an aspect of quality that they want to improve in their practice. They also decide how to approach and solve the problem. When discussing and reflecting on their own cases, GPs activate their existing knowledge, based on their everyday work, and recognise their own knowledge gaps. They create new concepts and ideas when they reflect on their own

experience, including discussing individual cases. They add information from other sources to illustrate their practice and then compare the current status of their practice with contemporary evidence-based educational material. Professional bodies or physician network organisations that implement regulations or contracts with health insurance companies must balance QC autonomy and stimulation to improve quality of care and keep the groups motivated. QC participants test new concepts and ideas and implement them in everyday practice. They progress along a learning curve as they perform and gain confidence in innovation while improving their QC techniques after each cycle of QI. I list the results of the realist analysis and their CMO configurations in Table 7.1.

Table 7.1 Summary of the context mechanism outcome (CMO) configurations based on the co-inquiry

CMO configuration I: **'sharing similar needs'** If health insurance companies require QI, and physician network organisations provide protected time and space, CME points and small financial incentives for participants (C), then GPs meet in groups to exchange ideas (O), because the organisational support generates positive expectations among participants and they believe these meetings with their peers will be useful (M).
CMO configuration II: **'size of the group affects communication'** If group size exceeds 15 (C), then communication becomes difficult (O), because participants cannot keep track of so many people (M).
CMO configuration III: **'need for relatedness'** If a steady group of members engages in socially enjoyable contact, led by a skilled facilitator who e.g. introduces people to each other, opens discussions and clarifies and summarises statements (C), then group members will get to know each other and decide on rules that they are willing to follow, building a safe environment based on trust (O) because members want to be among and to interact with equals (M).
CMO configuration IV: **'need for autonomy'** If the group chooses its own topics and facilitator (C), then it has a sense of ownership (O), because this satisfies the need for autonomy and control (M).
CMO configuration V: '**need for competence and self-actualisation'** If participants can tell their stories and experiences with the facilitator's support (e.g. encouragement of interactive responses and discussions, and summary of statements) in a safe environment (C), then they are involved in exchanging experiences and failures (O), because they want to be competent, gain professional confidence and fulfil their professional potential (M).
CMO configuration VI: **'previous knowledge is activated'** If participants exchange case stories and experiences while actively listening to each other in the presence of a skilled facilitator (C), then they will be motivated to share their knowledge through telling such relevant stories (O), because the process activates the knowledge they already possess (M).

CMO configuration VII: **'cognitive dissonance'** If participants discuss and reflect on their work processes during a professionally facilitated exchange of positive experiences or failures (C), then they become aware of knowledge gaps and identify learning needs and relevant topics (O), because conflicting attitudes and behaviours, together with differences between their own and other participants' knowledge, cause a cognitive dissonance (a negative emotional state triggered by conflicting perceptions) (M).
CMO configuration VIII: **'social learning'** If the participants know what they need to learn or know what topic they want to discuss, and if they reflect on their own and other participants' trustworthy data (their own cases, diagnostic habits or prescription patterns, or evidence-based material such as guidelines) and if the facilitator uses purposeful didactic techniques (such as brain-storming, discussions and role play) to keep the group active and to reward exploratory behaviour (C), then the group will create a learning environment that promotes knowledge exchange (O), because learning is a cognitive process in which participants observe and imitate their peers' behaviour to gain social approval (M).
CMO configuration IX: **'interdependence between health insurance companies and physician network organisations/QCs; tension between autonomy and obligation'** If physician network organisations require continuous QC activities (C), then QCs will negotiate priorities and design creative solutions (O), because the tension between autonomy and obligation spurs the group to act and negotiate together to reach a common goal (M).
CMO configuration X: **'interdependence among group members'** If participants maintain a learning environment based on trust that promotes knowledge exchange, assisted by facilitators who use professional techniques (e.g. contentious discussion, reaching consensus and role play) (C), then participants will adapt and generate new knowledge for local use (O), because they see themselves as similar, and thus act and negotiate cooperatively to achieve a common goal (M).
CMO configuration XI: **'gaining confidence in QC techniques'** If the group repeatedly practises implementing and adjusting to an innovation (C), then they trust their own competence and turn the innovation into a habit (O), because successful outcomes increase their confidence in their abilities (M).
CMO configuration XII: **'repetition priming and automaticity'** If participants establish a regular group and practise using QI tools (C), then they will successfully implement new knowledge in everyday practice (O), because responses improve with repetition: 'practice makes perfect' (M).

Focussing the research question

During the co-inquiry, Swiss QC experts and stakeholders (e.g. CEOs of physician networks or representatives of professional bodies) recognised the efficacy of QCs but could not generalise their results with confidence. They wanted to know how best to implement QCs in PHC: which components were key and which contextual features were most important. They understood that

QCs created a social context for reflective practice and that participants gained knowledge that changed their work practices but were not sure which components actually prompted practitioners to change their behaviour. I summarised participants' preferences when asked which research questions they felt were important to them (Table 7.2). I formulated my questions for the co-inquiry using Pawson's (2006) explanatory compendium for complex programmes as guidance. See Appendix 7.1 for detailed information about sources 1–6.

Table 7.2 Questions important to stakeholders (Pawson, 2006)

Central questions for stakeholders	Networks (1,2,4,5)	SSGIM (3)	FMH (6)
Programme Theory: *how and why does the programme work?*	Very important to all		
Reasoning and reactions of stakeholders: *are there differences in our basic understanding of the theory that supports the programme?*	Important to all		
Components of QCs and their implementation chain: *how and why are QCs used in PHC?*	Important to all		
Consistent use of the programme: *does the programme tend to deviate from the theory in actual usage?*	Unimportant to all		
Contextual influences*: what contextual features make the programme work and how?*	Very important to all		
Influence of other programmes: *do earlier or co-existing programmes have an effect on the present programme?*	Unimportant to all		
Long-term effects: *is there a habituation effect that decreases the effectiveness of QCs, or are there self-affirming effects that allow participants to adopt and use new knowledge more easily? Are there self-defeating effects among participants?*	Low importance	Unimportant	

Legend:
(1, 2, 4, 5) Networks are organisations that provide health services (PHC)
(3) Swiss Society of General Internal Medicine (SSIGM)
(6) Swiss Medical Association: Foederatio Medicorum Helveticorum (FMH)

Preliminary programme theory resulting from stakeholders' mental model

Using the rough programme theory and its concepts as my starting point, I analysed the data from the interviews and built a preliminary programme theory. The intermediate outcomes are preconditions for the next stage; if the groups fail to reach these preconditions, they may choose to

repeat processes. I shared illustrative quotes for each CMO configuration (translated into English). See Appendix 7.1 for all sources and quotes for each CMO configuration.

Intermediate Outcome 1: establishment of QCs and their group size

QCs meet the expectations and needs of health-care professionals such as GPs, who want to meet with their peers, share their problems and exchange ideas. QCs may choose their own CME/CPD topics and discuss QI issues. Health insurance companies may require physician networks and their associated health-care professionals to continually check and improve the quality of their work through QCs. Participating in QCs may earn health-care professionals CME credits, and health insurance companies may allocate money to the physician network, which then gives health-care professionals small grants for participating in QCs. The size of an effective QC may be limited, since communication difficulties increase when a group has more than 12–15 members. The networks that organise QCs should provide administrative support, appropriate rooms, protected time and equipment. A detailed analysis is presented in Table 7.3.

Table 7.3 Realist analysis – 'establishment of QCs and their group size'

CMO configuration I: **'sharing similar needs'** If health insurance companies require QI, and physician network organisations provide protected time and space, CME points and small financial incentives for participants (C), then GPs meet in groups to exchange ideas (O), because the organisational support generates positive expectations among participants and they believe these meetings with their peers will be useful (M). *Organisation is important in creating space, in terms of time, place and mental space, so that sensitive issues can be discussed [translated from German] (3).* *Nobody feels forced, although the network stipulates 20 QCs per year. There is a reward that is nice to have but is no real motivation, even if it is about an hour's work [translated from German] (4).*
CMO configuration II: **'size of the group affects communication'** If the group size exceeds 15 (C), then communication becomes difficult (O), because participants cannot keep track of so many people (M). *The process came to a halt when there were more than 20 members in the group, and the QC could no longer offer everyone a platform for discussion [translated from German] (4).*

Intermediate Outcome 2: establishment of a safe environment

Skilled facilitators appear to be the key to forming and norming the group. They introduce people, open discussions, clarify and summarise statements. Groups choose their own facilitators from among their members and keep the hierarchy flat. Facilitators introduce norms into the group by developing the rules and routines that build the QC's identity and help create a safe environment in which members can trust each other. The process of forming and norming a group includes enjoyable activities and provides social benefits. In order to reach this intermediate outcome, QCs seem to need long-term members and autonomy in choosing their facilitators and the topics for discussion. QC members want to be among and interact with peers, a mechanism that needs to be activated time and again in an ongoing process. I present the realist analysis in Table 7.4.

Table 7.4 Realist analysis – 'establishing a safe environment'

CMO configuration III: **'need for relatedness'** If a regular group of members engages in socially enjoyable contact, led by a skilled facilitator who e.g. introduces people to each other, opens discussions, clarifies and summarises statements (C), then group members will get to know each other and decide on rules that they are willing to follow, building a safe environment based on trust (O), because they want to be among and to interact with equals (M). *Social benefits of QCs are important – we have a bite to eat and have a drink and enjoy ourselves (7).* *You feel that you are in the right place - in a physician-owned group practice with budget responsibility - being and belonging together [translated from German] (4).* *We, the GPs, speak the same language; we understand each other in the groups, have the same understanding of each other's problems, which allows very close contact (7).*
CMO configuration IV: **'need for autonomy'** If the group chooses its own topics and facilitator (C), then it has a sense of ownership (O), because this satisfies the need for autonomy and control (M). *The participants' motivation also depends on the choice of topic. As there is autonomy regarding the choice of topic, this is not an issue [translated from German] (4).* *Instead of being an expert or bureaucratic, they (the facilitator) should be a kind of coach or rather one of us, one we choose, who motivates the members of the group and keeps the focus (7).*

Intermediate Outcome 3: exchange of experiences and failures

Skilled facilitation of narratives such as case stories creates a context in which group members who are familiar with each other can share experiences, failures and knowledge, confiding to peers in a safe environment. Facilitators should inspire participants to respond interactively, while respecting one another's contributions, and should encourage discussion and summarise statements. GPs are keen to discuss professional values with peers who understand what their work is really about. They value the safe feeling in the group and believe that relating their own experiences and listening to others increases their professional competence. As they trust their peers, they can be authentic, and participation makes them feel active and involved. The realist analysis is shown in Table 7.5.

Table 7.5 Realist analysis - exchange of experiences and failures

CMO configuration V: **'need for competence and self-actualisation'** If participants can tell their stories and experiences with the facilitator's support (e.g. encouragement of interactive responses and discussion, and summary of statements) in a safe environment (C), then they are involved in exchanging experiences and failures (O), because they want to be competent, gain professional confidence and fulfil their professional potential (M). *There is an exchange of knowledge and experience, including critical events that can be addressed and discussed [translated from German] (6).* *Professional development can feel good – it increases self-esteem and leads to satisfaction [translated from German] (3).*

Intermediate Outcome 4: 'identification of learning needs'

By using active listening skills, facilitators help participants to reflect on their case stories, whether these are positive experiences or failures. When group members listen actively, this stimulates colleagues to share their knowledge in the form of stories, and others respond by sharing their own relevant experiences. Listening and giving attention to one another's stories increases participants' awareness of their own and others' knowledge; they can then identify their learning needs and select relevant topics to address. The realist analysis is presented in Table 7.6.

Table 7.6 Realist analysis - 'identification of learning needs'

CMO configuration VI: **'previous knowledge is activated'** If participants exchange case stories and experiences while actively listening to each other in the presence of a skilled facilitator (C), then they will be motivated to share their knowledge through telling their own relevant stories (O), because the process activates the knowledge they already possess (M). *When participants discuss clinical cases, they exchange knowledge during discussions. They stimulate each other to disclose their tacit knowledge and informally exchange thoughts at various levels, including the social levels of everyday working life [translated from German] (6).* *The discussion of cases activates pre-existing knowledge, and participants become aware of the gaps in their discussion [translated from German] (3).*
CMO configuration VII: **'cognitive dissonance'** If participants discuss and reflect on their work processes during a professionally facilitated exchange of positive experiences or failures (C), then they become aware of knowledge gaps and identify learning needs and relevant topics (O), because conflicting attitudes and behaviours, together with differences between their own and other participants' knowledge, cause a cognitive dissonance (a negative emotional state triggered by conflicting perceptions) (M). *When participants show each other what they are doing, it is like a reality check because you experience the reaction of the other participants, and that helps to improve patient care in general and your clinical practice. The group is a good tool to make you recognise gaps in knowledge [translated from German] (4).*

Intermediate Outcome 5: 'creating a learning environment'

Once the group defines an educational need or selects a topic, the task-oriented facilitator helps members to choose the method they will use to approach the issue. They may, for example, use trustworthy data from their own practice, such as diagnostic habits or prescription patterns, or draw on study articles, critical incidents or EBM-based educational material. Reflecting on one's own results and comparing them to those of colleagues helps participants to learn from the practices of their peers. Facilitators use didactic techniques, such as brain-storming, discussion and role play, to keep the group active and to reward exploratory behaviour. The facilitators maintain a learning environment where group members can exchange knowledge. The realist analysis is shown in Table 7.7.

Table 7.7 Realist analysis – 'creating a learning environment'

CMO configuration VIII: **'social learning'** If the participants know what they need to learn or know what topic they want to discuss, and if they reflect on their own and other participants' trustworthy data (their own cases, diagnostic habits or prescription patterns, or evidence-based material such as guidelines) and the facilitator uses purposeful didactic techniques (such as brain-storming, discussion and role play) to keep the group active and to reward exploratory behaviour (C), then the group will create a learning environment that promotes knowledge exchange (O), because learning is a cognitive process in which participants observe and imitate their peers' behaviour to gain social approval (M). *Participants want to gain an outside view of their own activity and reflect, which requires a certain amount of openness [translated from German]* (5). *When you compare your practice with your colleagues', then you feel more confident about your own qualities [translated from German]* (5). *It is important that the group can look at and reflect on their own data and compare them within the group (7).*

Intermediate Outcome 6: 'creating new or locally adapted knowledge'

If a facilitator maintains the learning environment, participants can negotiate which topics should take priority. They will acquire new knowledge during the discussion, as they share knowledge and then plan to implement it. If facilitators use techniques such as contentious discussion and reaching consensus, participants can explore and test new knowledge and adapt it to their needs. Developing new knowledge creates a sense of community ('we') and ownership; participants see themselves as similar and will cooperate to reach a common goal. Physician network organisations must balance autonomy and stimulation to improve performance if they want to keep QC participants active and increase the likelihood that they will implement innovations. Table 7.8 shows the realist analysis.

Table 7.8 Realist analysis - 'creating new or locally adapted knowledge'

CMO configuration IX: **'interdependence between health insurance companies and physician network organisations/QCs; tension between autonomy and obligation'** If physician network organisations require continuous QC activities (C), then QCs will negotiate priorities and design creative solutions (O), because the tension between autonomy and obligation spurs the group to act and negotiate together to reach a common goal (M).

When QCs are mandatory, they become a clear task for quality improvement. Participants can decide on its content [translated from German] (1).
CMO configuration X: **'interdependence among group members'** If participants maintain a learning environment based on trust that promotes knowledge exchange, assisted by facilitators who use professional techniques (e.g. contentious discussion, reaching consensus and role play) (C), then participants will adapt and generate new knowledge for local use (O), because they see themselves as similar, and thus act and negotiate cooperatively to achieve a common goal (M). *Actively dealing with a topic, purposefully guided by a facilitator, promotes intrinsic motivation; QCs are based on voluntary actions. Intrinsic motivation is a driving force, together with the pressure from role models and the policy of the company [translated from German] (5).*

Intermediate Outcome 7: 'implementation of new knowledge in everyday practice'

The group learns to trust that it can cope with innovation after it has participated in an iterative process in which it implements and then evaluates new, locally adapted knowledge. Integrating new knowledge thus becomes a habit. QCs have a learning curve: the continuity of the group and its experience in implementing QC techniques determine how successfully it can implement new knowledge in everyday practice. I outline the realist analysis in Table 7.9.

Table 7.9 Realist analysis - 'implementation of new knowledge in everyday practice'

CMO configuration XI: **'gaining confidence in innovations'** If the group repeatedly practises implementing and adjusting to an innovation (C), then they trust their own competence and turn the innovation into a habit (O), because successful outcomes increase their confidence in their abilities (M). *Repeated feedback of the results to the participants builds trust, makes them recognise the benefits and leads to routine [translated from German] (3).*
CMO configuration XII: **'gaining confidence in QC techniques'; 'repetition priming and automaticity'** If participants build a regular group and practise using QI tools (C), then they will successfully implement new knowledge into everyday practice (O), because responses improve with repetition: 'practice makes perfect' (M). *Repetition and continuity in the group are important for cohesion and the skilled use of QC techniques: 8–14 doctors meet regularly – at least 10 (QCs) per year are therefore mandatory in the network [translated from German] (2).*

My supervisors (SM, JH) and I discussed and described the stages and contextual features necessary for QC performance, as stated above. These are set out below and became the basis of my preliminary theory, which I used as a starting point for the programme theory that I developed from the literature in Phase III:

- Addressing practitioners' needs
- Forming and norming the Group
- Exchanging positive experiences and failures
- Identifying learning needs; planning actions; setting priorities and goals
- Creating the learning environment
- Seeking solutions and adaptions; creating new knowledge
- Systematically integrating new knowledge.

In this process, groups seem to be affected at several levels:

- The level of the individual (capabilities and motivations)
- The group level (the group and the facilitation process)
- The organisational level (e.g. within a network that provides primary health care)
- The national bureaucratic level (e.g. the Federal Office of Public Health or similar administrative body).

Chapter Eight: Results of Phase III: developing and refining a programme theory using the realist review and interview data

This chapter explains the results of the realist review and how I used secondary data from the literature to refine and develop the preliminary programme theory. It also summarises the results of a series of interviews and focus groups that questioned the CMO configurations I found in the literature; these mainly covered QCs with GPs. I conducted the search in October 2013 and updated it in December 2017 to capture later papers, using the same method.

In this overview, I outline the programme theory as it emerged from the data presented in Chapter Eight and list the CMO configurations in Table 8.1. GPs take on QI responsibilities with the precondition that they are entrusted with this task and can work on their own initiative. Obligations imposed at organisational level may increase GP motivation, for instance, when health insurance companies demand continuing QI in their contracts with physician networks. Such organisations should acknowledge and value the local use of QC innovations, which reassures and motivates GPs in their work. They should also provide administrative support, training and mentoring opportunities for QC facilitators. GPs should come to a common understanding of what quality in PHC means, how QCs function and what they should expect. When introducing QCs, GPs need information if they are to avoid misunderstandings and false expectations. Generally, GPs need to meet as equals to discuss their everyday professional challenges; this is their preferred learning style. Many GPs have to recertify and, in some countries, CME credits from QCs help them to complete this process, making QCs an attractive alternative.

A group that works in a safe and supportive environment is essential for the QC process. Members of the group agree on common rules, so they can be honest and exchange their experiences in an atmosphere of mutual trust. Enjoyable social activities, such as sharing a meal or a glass of wine, seem an appropriate method for this. Participants also want to choose their own facilitator, the topics they wish to discuss and the methods for improving quality in their practices. A group size

exceeding 15 hinders interactive responses and discussions. Diligent facilitation resolves conflicts in a target-oriented way and supports the group dynamics to improve QC performance. In the group, diversity in thinking and experience is important for interactive discussion if the participants accept and respect each other. Data indicate that some participants may feel that differing attitudes and ways of working threaten their professional identity and they may therefore disrupt or leave the group.

In a safe group, skilled facilitators can create a learning environment by choosing appropriate didactic methods and QI tools. They use active listening skills and encourage members to respond to each other's experiences. Based on personal experience, a cycle of learning starts in which GPs compare their performance with that of their peers. This may include comparison of differing experiences but also comparison with evidence-based information (best practice) or diagnostic or prescription patterns, which makes GPs reflect on their way of working. Facilitators use didactic techniques such as contentious or consensus discussions, or role play, and maintain a learning environment in which participants can exchange knowledge and learn from each other.

Legal obligations and pressure from health insurance companies stimulate QCs to devise creative solutions to improve their quality of care. There is a delicate balance between respecting professional autonomy and stimulating QI. Under these conditions, GPs adapt or create new knowledge based on their experiences and the thoughts exchanged during the learning process. When they create and test new knowledge, they feel a great sense of satisfaction and ownership. Commitment to change seems to be a precursor for behavioural change, probably because committed participants favour change and believe they can make it happen. The role of the facilitator is to maintain a supportive environment that encourages participants to identify barriers when testing innovations.

GPs gain confidence in innovations through repeated use and, thus, become better at handling them in different situations. It takes several rounds of discussions and feedback from reliable data

to change behaviour. In this process, participants also gain expertise in QC skills through repeated use of didactic techniques and tools to complete the QI cycle.

Table 8.1 Summary of all the context mechanism outcome (CMO) configurations based on Chapter Eight

I. **Preconditions** a) 'Need for autonomy and obligation' If the administration at national level or at the level of health insurance companies entrusts GPs with QI and autonomy, so they can decide how to implement it (C), then GPs might participate in QCs (O) because they feel they can take on the responsibility and make a difference (M). b) 'Feeling they have a say' If an organisation, (e.g. a physician network organisation) has a decentralised policy that encourages the use of local knowledge (C), then the QC takes on tasks (O) because members feel that they have a say in QI in their practice (M). c) 'Participants know what to expect' If the introductory workshop teaches the principles of QI in PHC and illustrates how QCs work(C), then potential members may be more willing to join QCs (O) because they know what to expect and feel that they can meet expectations (M).
II. **Establishing the group** a) 'Sharing similar needs' If the administration at organisational level provides support (i.e. in training facilitators, data gathering, provision of evidence-based information), protects time and space, and offers CME points and small financial incentives to QC participants (C), then they will meet in groups to exchange ideas (O) because GPs prefer learning in QCs (M); support generates positive expectations among participants (M) and GPs believe that QC meetings with their peers will be useful (M). b) 'Need for relatedness' If a regular group of members engages in socially enjoyable contact, led by a skilled facilitator who, for instance, introduces people to each other, opens discussions, clarifies and summarises statements (C), then group members will get to know each other and decide on rules that they are willing to follow, building a safe environment based on trust (O) because members want to be among and to interact with equals (M). c) 'Need for autonomy and control' If the group members choose their own topics and facilitator (C), then its members will feel they own the QC (O) because their need for autonomy – a feeling of being in control of their own behaviour – is satisfied (M). d) 'Size of the group affects communication' If the group size exceeds 15 (C), then interaction among group participants decreases (O) because participants cannot keep up with each other and follow all the conversations (M).

e) ‘Variety of characters stimulates reflection – cognitive dissonance’

If members of the group have individual character traits and describe different professional experiences but accept each other’s views (C), then they can learn from each other (O) because individual attitudes and behaviours will contrast with the knowledge of their peers and cause cognitive dissonance (a negative emotional state triggered by conflicting perceptions) that makes them reflect on their way of working (M).

f) ‘Strong cognitive dissonance threatens self-image’

If individuals feel too strong a cognitive dissonance when integrating new knowledge (C), then they may disrupt group dynamics and halt the QC process (O) because their self-image is threatened and they fear the loss of their professional identity (M).

III. Learning environment

a) ‘Feeling safe and not vulnerable’

If participants trust each other (C), then they can describe how they work and admit what they do not know (O), because they feel safe rather than vulnerable (M).

b) ‘Need for competence and self-actualisation’

If the facilitator supports participants and encourages them to tell their stories and share their experiences in a safe environment, e.g. by encouraging interactive responses, through discussion and by summarising statements, (C) then participants will become involved and share their positive experiences and failures (O) because they want to improve their professional competence (M), gain professional confidence (M) and fulfil their professional potential (M).

c) ‘Previous knowledge is activated’

If participants exchange case stories and experiences while actively listening to each other in the presence of a skilled facilitator in a safe environment (C), then they will share their knowledge by telling their own relevant stories (O) because the process activates knowledge they already possess (M).

d) ‘Immediate relevance for the practice’

If QCs use the technique of experience-based learning (C), then knowledge becomes more relevant to GPs (O) because it relates to their everyday work and they can use it immediately (M).

e) ‘Cognitive dissonance’

If participants discuss and reflect on their work processes (e.g. based on trustworthy data or personal experiences) during a professionally facilitated exchange of positive experiences or failures (C), then they discover knowledge gaps and identify learning needs and relevant topics (O) because their own attitudes and behaviours may differ from their peers’, creating cognitive dissonance that makes them reconsider their own way of working (M).

f) ‘Social learning’

If the facilitator uses purposeful didactic techniques (e.g. brainstorming, contentious or consensus discussions, or role play) to keep the group active and to reward exploratory behaviour during reflection on the work process (C), then the group will create a learning environment that promotes knowledge exchange (O) because learning is a cognitive process in which participants observe and imitate their peers’ behaviour to gain social approval (M).

IV. **Adapting, creating and testing new knowledge**

a) 'Positive interdependence between health insurance companies (or administration at the national level) and GPs'

If physician network organisations require continuous QC activities (C), then QCs will negotiate priorities and design creative solutions (O) because the tension between autonomy and obligation spurs the group to act and negotiate together to reach a common goal (M).

b) 'Threat to professional autonomy'

If GPs feel that the QC programme is only a top-down managerial intervention to reduce costs (C), then they will not be motivated and will not participate (O) because they feel unsafe and fear they lack autonomy in their clinical role (M).

c) 'Positive interdependence among group members'

If participants maintain a learning environment based on trust that promotes the exchange of knowledge, assisted by facilitators who use professional techniques (e.g. contentious discussion, reaching consensus and role play) (C), then participants will adapt and generate new knowledge for local use (O) because they see themselves as similar, and so act and negotiate cooperatively to achieve a common goal (M).

d) 'Identifying and removing barriers to change'

If participants, supported by skilled facilitators, address barriers to change (C), then they are more likely to implement the innovation (O) because participants help each other to develop strategies to identify and overcome these barriers (M).

e) 'Need for competence, autonomy and relatedness'

If participants create new knowledge and plan an implementation strategy (C), then they feel satisfaction, responsibility and stewardship (O) because this fulfils their need for competence (being able to achieve specific objectives) (M), autonomy (a feeling of being in control of their own behaviour) (M) and relatedness (a sense of connection to a larger group) (M).

f) 'Intention to change'

If participants publicly announce their intention to change (C), then they are more likely to implement the change (O) because they and others in the group all think it is a good idea and believe they can carry it through (M).

g) 'Testing new knowledge'

If participants validate and test new knowledge in a QC, moderated by a skilled facilitator in a safe environment (C), then they feel confident putting that knowledge to use in everyday practice (O) because they have had the opportunity to practise and familiarise themselves with the innovation (M).

V. **Repeating the process**

a) ‘Gaining confidence in an innovation’

If the group repeatedly practises implementing and adjusting to an innovation (C), then its members trust their own competence and turn the innovation into a habit (O) because successful outcomes increase their confidence in their abilities (M).

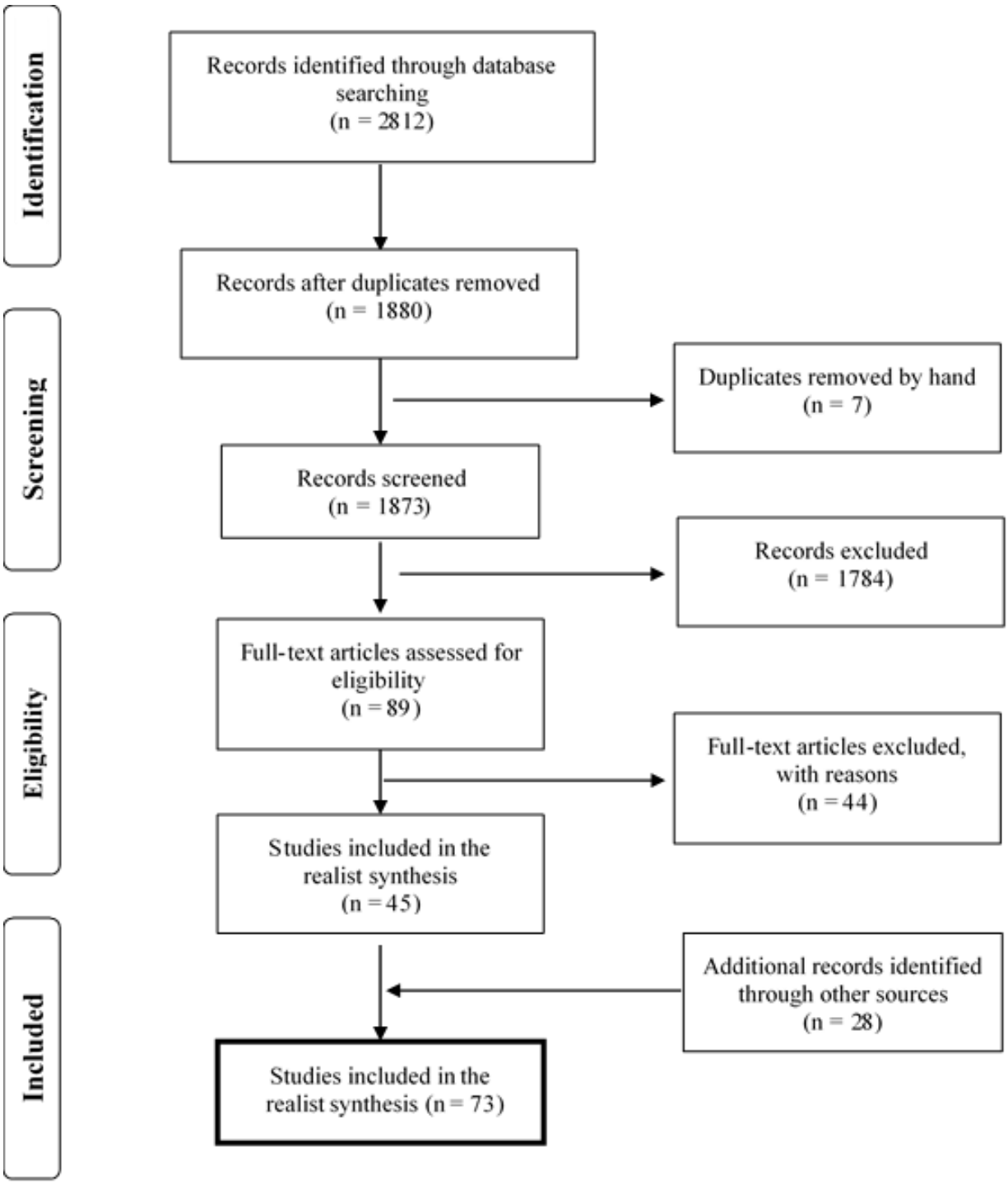
b) ‘Repetition priming and automaticity’

If participants establish a regular group and practise using QI tools (C), then they will successfully implement new knowledge into everyday practice (O) because responses improve with repetition: ‘practice makes perfect’ (M).

Realist review: literature-based programme theory

The improved search strategy described in Chapter Four returned 2,812 results. After removing duplicates, AR, JH and SM identified 89 papers for full-text assessment. Forty-four papers were excluded because they did not fulfil the eligibility criteria; 28 further papers were included after searching for kinship papers in bibliographies of relevant articles, the Web of Science and Google Scholar. As contacts with authors yielded no further results, I assessed 73 papers and extracted their data for analysis. The paper flow is described in Figure 8.1.

Figure 8.1 Flow diagram realist review: 7th October, 2013



The literature primarily covered QCs in which GPs participated. I found 24 relevant articles about German QCs, 12 about Dutch and two about Swiss QCs. Ten papers related to CME groups in Canada and Scotland. Six papers were about a QC research project in Norway; three about QCs on osteoporosis in Canada and five about the Drug Education Project in Sweden, Norway, the Netherlands and Slovakia. A further six papers covered QC projects in England, Austria, Belgium and France. Finally, I identified five papers about QCs in South Africa, the US (Hawaii and California) New Zealand and Australia. I categorised the papers into groups to clarify the relationships between them, including an underlying trial, common themes, common contexts – such as geographical area, or common methods of organising QCs, e.g. papers that tested similar didactic methods or similar QI tools in QCs.

Study designs varied by research question. My search returned five study protocols, two case series, 14 before-and-after studies, 13 controlled before-and-after studies, nine randomised controlled trials, nine cluster randomised controlled trials, 12 surveys and nine qualitative research papers that used data from interviews or focus groups. The studies examined the introduction and also evaluated the process in QCs. They examined the dynamics in the group, their facilitation and the use of didactic or QI tools, e.g. different ways of using audit and feedback. The specific research question was frequently concerned with whether QCs improved prescription or test-ordering patterns, guideline adherence or reduced costs. The studies tested different QC ingredients, such as the use of evidence-based information or variations in audit and feedback. Researchers followed the results of the intervention for three to twelve months. Sometimes the final measurements were taken after 18 months, but very few followed the group over several years. I found few papers examining the performance of well-established QCs, so data were often limited to interventions in newly formed groups. In existing QCs (German, Dutch or Norwegian trials),

researchers did not usually study an intervention planned by the group itself but, instead, studied interventions introduced by the researchers.

QCs ranged from 6 to 12 participants, the majority of whom were GPs. In Germany, Scotland and the Netherlands, medical practice assistants, practice nurses and midwives sometimes participated. Facilitators either belonged to the group or, in some cases, were members of a research team that visited different groups. They were frequently GPs but, in Germany and the Netherlands, they could also be medical practice assistants. When QCs explored prescribing patterns, pharmacists sometimes took on the role. Facilitators opened discussions, clarified statements, summarised what was said or questioned issues. They endeavoured to create a learning environment and used different didactic or QI techniques to shape this, including brainstorming, consensus discussions, use of evidence-based information or academic detailing. The majority had received training for their role. Table 8.2 provides an overview of the study characteristics.

Table 8.2 Study characteristics

Author year	Country	Study design	Set-ting	Participants, professional background	Study duration	Objective and intervention setting	Facilitation and group dynamics	Didactic and QI technique	Outcome oriented data	Common characteristics of the cluster (kinship)
Norwegian papers on peer groups										
Gjelstad 2006	Norway	Study protocol	PHC	80 CME groups; 7–8 GPs in each group located in the southern part of Norway	6 months: meetings once a month; the study covered 3 meetings.	Reduce prescription of antibiotics for upper respiratory tract infections and prescription of inappropriate drugs for elderly. Pre-existing CME groups.	Trained tutor serving 3 CME groups, reflection on own prescription strategies, disclosure of areas for individual improvement.	Discussions, reflective thinking on individual prescription data, one-day introductory workshop, audit and feedback, group educational outreach visits, academic detailing.	After one year, improvement of prescription patterns was expected.	Norwegian QC studies on improving drug prescriptions, accompanied by a qualitative study. Brekke provided the baseline study for the trial.
Gjelstad 2013	Norway	Cluster randomised controlled trial	PHC	80 CME groups; 7–8 GPs in each group located in the southern part of Norway	6 months: meetings once a month; the study covered 3 meetings.	As in Gjelstad 2006 Each group acted as blind control for the other groups (Rognstad 2013).	As in Gjelstad 2006	Authors consider the key element in the study to be 'what happens to a general practitioner's prescribing behaviour when they reflect on their prescriptions'.	After one year, reduction of prescription rate of antibiotics and increase of prescription rate of penicillin compared to control groups.	

Author year	Country	Study design	Set-ting	Participants, professional background	Study duration	Objective and intervention setting	Facilitation and group dynamics	Didactic and QI technique	Outcome oriented data	Common characteristics of the cluster (kinship)
Straand 2006	Norway	Study protocol	Norwe gian PHC	80 CME groups; 7–8 GPs in each group located in the southern part of Norway	6 months: meetings once a month; the study covered 3 meetings.	Reduce prescription of inappropriate drugs for elderly people and prescription of antibiotics in upper respiratory tract infections. Pre-existing CME groups.	Trained tutor serving 3 CME groups, reflection on own prescription strategies, disclosure of areas for individual improvements.	As in Gjelstad 2006	After one year: reduction of inappropriate prescription patterns to elderly out-patients ≥ 70 years.	Norwegian QC studies on improving drug prescriptions, accompanied by a qualitative study. Brekke provided the baseline study for the trial.
Brekke 2008	Norway	Cross-sectional study	PHC	454 GPs in 80 CME groups, 85,836 patients	6 months	Baseline data of ongoing CME groups for one year	Ongoing CME groups without intervention	Ongoing CME groups	After 1 year:18.4% of the patients received at least one inappropriate prescription.	
Rogn-stad 2013	Norway	Cluster randomised controlled trial	PHC	80 CME groups; 7–8 GPs in each group located in the southern part of Norway	6 months: meetings once a month; the study covered 3 meetings.	As in Straand 2006 Each group acted as blind control for the other groups (Gjelstad 2013).	Training in drug treatment of elderly people, the rationale for the 13 listed inappropriate drugs, how to facilitate learning within a group setting.	Audit and feedback, tailored feedback, tailored academic detailing, discussions of own prescribing pattern.	After one year, reduction of inappropriate prescriptions for elderly people. Potentially more harmful combinations were more likely to be reduced.	

Author year	Country	Study design	Set-ting	Participants, professional background	Study duration	Objective and intervention setting	Facilitation and group dynamics	Didactic and QI technique	Outcome oriented data	Common characteristics of the cluster (kinship)
Frich 2010	Norway	Qualitative study to explore experiences with academic detailing	PHC	39 GPs and 20 tutors who were also GPs, 9 focus groups	6 months: meetings once a month; the study covered 3 meetings.	Qualitative analysis of the RCTs, focusing on three meetings with the CME groups.	Groups have their own cultures; tutors perceived themselves as members of the group.	Consensus discussions, audit and feedback, academic detailing, discussions of their own cases.	Reflective thinking increased; inappropriate results upset some GPs.	
Dutch papers on peer groups										
Geboer 1999	The Nether-lands	Case series	PHC	All staff of 20 general practices (each working as a group) tested the model over a period of 18 months.	18 months. Monthly quality meetings.	Evaluate the feasibility of a model for continuous quality improvement (CQI) in small practices.	Trained facilitators: practice assistants with managerial experience. Involving all staff at regular meetings.	Course on CQI: choose topic, observe practice, compare performance with targets, implement change, plan care and repeat cycle.	After 18 months, this model seemed feasible to the authors.	Dutch QC studies of a continuous quality improvement model.
Geboer 2001	The Nether-lands	Mixed methods: before-and-after study and qualitative inquiry	PHC	20 practices (each working as a group): 53 physicians and 57 medical practice assistants	18 months. Monthly quality meetings.	Measure the attitude towards CQI model in small practices before and after study.	As in Geboer, 1999	Feedback on practice assessment, introductory meeting, support for adoption of the model.	After 18 months, participants experienced perceived success and were willing to continue.	

Author year	Country	Study design	Set-ting	Participants, professional background	Study duration	Objective and intervention setting	Facilitation and group dynamics	Didactic and QI technique	Outcome oriented data	Common characteristics of the cluster (kinship)
Engels 2003	The Nether-lands	Controlled before-and-after study	Mid-wives, mainly PHC	255 midwives in 28 groups	Study period 1998 to 2000	Measure CQI effect on clinical practice of midwives in PHC in a before-and-after study.	Three-day training of facilitators. Peer groups of midwives in the same geographical area. Regular group meetings.	Allocated topics with no choice, using the CQI model.	Positive effect on change of clinical practice was noted. Technical skills could not be improved.	Dutch QC studies of a continuous quality improvement model.
Engels 2006	The Nether-lands	Ran-domised controlled trial	PHC	26 sites in the intervention and 23 sites as controls. Size and composition of groups unknown.	December 2001 - February 2004; inclusion October 2001 - April 2003	Examine the effects of a team-based model for CQI on primary-care practice management in small-scale practices.	Medical practice assistants as facilitators after 3 days' training.	Visitation Instrument for Practice (VIP) provided topics, CQI model with detailed oral and written feedback, monthly team meetings.	Evaluation after one year showed an increased number of CQI projects compared to control group, but the study was statistically underpowered.	
Verstap-pen 2003	The Nether-lands	Multicentre, randomised controlled trial	PHC	26 QCs consisting of 174 GPs.	6 months of baseline followed by 6 months' inter-vention.	Determine the effects of a multifaceted strategy aimed at improving test ordering patterns in pre-existing QCs. 3 meetings took place.	Discussion and comparison of feedback reports among colleagues, communication course.	GPs discussed 3 consecutive, personal-feedback reports, comparison of results with 3 evidence-based guidelines, plans for change, discussion of Bayesian decision rules.	Modest improvement in test ordering when comparing the two intervention groups	Dutch QCs on improving test ordering

Author year	Country	Study design	Set-ting	Participants, professional background	Study duration	Objective and intervention setting	Facilitation and group dynamics	Didactic and QI technique	Outcome oriented data	Common characteristics of the cluster (kinship)
Verstap-pen 2003	The Nether-lands	Cluster randomised controlled trial	PHC	27 QCs consisting of 194 GPs.	6 months of baseline followed by 6 months' inter-vention.	A multifaceted strategy aimed at improving test-ordering patterns in pre-existing QCs; 13 QCs followed a new strategy while 14 only received feedback.	Discussion and comparison of feedback reports among colleagues, communication training. 3 meetings.	As in Verstappen 2003	Compared to feedback, the tailored intervention decreased test ordering significantly.	Dutch QCs on improving test ordering
Verstap-pen 2004	The Nether-lands	Cluster randomised trial	PHC	27 QCs consisting of 194 GPs. 13 QCs used a new strategy while 14 only received feedback	6 months of baseline followed by 6 months' inter-vention.	Determine the effects of a multifaceted strategy in pre-existing QCs aimed at improving test ordering patterns. 3 meetings took place.	Discussion and comparison of feedback reports among colleagues, communication course.	As in Verstappen 2003	Mean costs were reduced by cutting unnecessary tests.	
Verstap-pen 2004	The Nether-lands	Cluster randomised trial	PHC	27 QCs consisting of 194 GPs. Mean group size was 7.4	6 months of baseline followed by 6 months' inter-vention.	A process evaluation of a multifaceted strategy in pre-existing QCs aimed at improving test ordering patterns.	Discussion and comparison of feedback reports among colleagues using feedback in pairs, communication course.	As in Verstappen 2003	Individual plans for change and group plan changes were made with a high level of satisfaction.	

Author year	Country	Study design	Set-ting	Participants, professional background	Study duration	Objective and intervention setting	Facilitation and group dynamics	Didactic and QI technique	Outcome oriented data	Common characteristics of the cluster (kinship)
Smeele 1999	The Nether-lands	Ran-domised controlled trial	PHC	2 QCs, 17 GPs in each group	Pre-measure-ment and post-measure-ment after one year.	Evaluate the effects of a QC programme on guideline adherence. 4 sessions for GPs and 1 session for medical practice assistants.	The group education was conducted in two small groups with 9 and 8 GPs respectively. Facilitator was a GP. Not all GPs participated in all sessions.	Lectures, role-play, skills training, peer review of performance, group consensus discussions and problem-solving of hypothetical situations involving patients.	No significant changes were found for care provided and patient outcomes compared with the control group.	Dutch QC studies on guideline adherence.
Kasje 2006	The Nether-lands	Cluster randomised trial using a balanced incomplete block design.	PHC	10 peer review groups (97 GPs): chronic heart failure. 6 peer review groups (46 GPs): hypertension and diabetes mellitus type 2.	One educa-tional meeting followed by data collection after 6 months	Evaluate the effects of a QC programme on guideline adherence in pre-existing groups. One group received a programme on chronic heart failure, the other on diabetes mellitus type 2.	Facilitators adhered to a specific process.	One meeting: consensus about guideline statements, evaluation of current management of five of their own patients, listing barriers and possible solutions, formulation of personal intentions	No effect was shown. High dropout rate especially in the group dealing with diabetic patients. The programme was not implemented as intended.	

Author year	Country	Study design	Set-ting	Participants, professional background	Study duration	Objective and intervention setting	Facilitation and group dynamics	Didactic and QI technique	Outcome oriented data	Common characteristics of the cluster (kinship)
Van Eijk 2001	The Nether-lands	Ran-domised controlled trial with three parts: individual visits, group visits, and a control group.	GPs and phar-ma-cists in PHC	Individual approach: 70 GPs and 14 pharmacists; Group approach: 52 GPs and 9 pharmacists in five QCs; Control: 68 GPs and their 13 pharmacists.	12 months	Compare the effect of individual educational visits versus group visits to improve inappropriate prescriptions for elderly people. Pre-existing groups of GPs and local pharmacists. 3 visits at 4-month intervals.	There was no description about the process that took place in the groups or at the individual level.	First visit: guidelines about appropriate prescription of drugs for elderly. Second visit: personal prescription habits were highlighted. Third visit: short follow up	The individual and the group approach led to a reduction in the rate of starting inappropriate drugs and to an increase of prescription of appropriate drugs.	Dutch QC studies on improving drug prescriptions involving pharmacists.
Wel-schen 2004	The Nether-lands	Ran-domised controlled trial.	GPs and phar-ma-cists in Dutch PHC	12 peer review groups including 100 GPs with their collaborating pharmacists.	Approx. 6 months. Evalu-ation after 9 months.	Reduce prescription of antibiotics to patients with upper respiratory tract infections in pre-existing groups.	Group education with consensus procedure. One meeting followed by individual feedback after 2 weeks and 6 months.	Group education meeting about guidelines, communication skills training, patient leaflets. After 2 weeks and 6 months, individualised feedback.	Prescription rate for antibiotics was reduced after 9 months. After 15 months, the effect was lasting. Satisfaction among patients remained high.	

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Problem Based Small Group Learning (PBSGL) in Canada, Scotland and England										
Davis 1999	Canada	Case series	PHC	54 GPs in 4 newly formed groups.	A 2.5-hour workshop	Develop and evaluate a CME programme on osteoporosis for PHC. 54 family physicians participated in 1 of 4 pilot PBSG learning sessions.	GP trained as a facilitator. The facilitator elicited interactive responses using specific predetermined prompting questions.	Practice-based case scenarios to increase awareness of risk factors for osteoporosis.	Participants' satisfaction was high. Participants increased their knowledge scores (not significant because of size of the study).	Papers about Practice Based Small Group Learning in Canada, Scotland and England
Mc Sherry 2000	Canada	Before-and-after study	PHC	544 GPs in 75 workshops with a mean of 7 GPs in each newly formed group.	A 2-hour workshop with question-naires before and after.	Pilot study to introduce PBSGL groups in PHC. Topic: a patient-centred approach to managing benign prostate problems and evaluate 'intent to change'.	Initial needs assessment, problem-based educational materials, opportunities for participants to develop implementation strategies through discussion with peers.	Educational video case studies illustrating various presentations of prostatism, a handbook with detailed information on the case studies. A toll-free telephone line was provided for scientific and technical support.	Practice behaviours were improved, especially those linked to a patient-centred approach not commonly practised before the workshops.	

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Peloso 2000	Canada	Qualitative inquiry over three years	PHC	12–15 GPs, a facilitator and sometimes an expert.	3 years	Discuss a 3-year experience with the small-group format, comprising more than 25 sessions as either learners or facilitators. Facilitators have 20 hours of training. Monthly meetings, each session takes 1.5 to 2 hours.	Sessions took place in the evenings with a meal in a relaxed atmosphere. The group chose their topics. Presentation of own clinical cases. Experts did not lecture but answered questions.	Learner-directed agenda of topics, information from trusted peers, opportunity for feedback. Information from several sources – printed materials, peer discussion, patient questions – the perception of need for change is enhanced.	GPs can discuss topics relevant to day-to-day practice and obtain access to local experts. They compare their practice with that of others. The group and the inter-active format are fun. Experts are comfortable with the format.	Papers about Practice Based Small Group Learning in Canada, Scotland and England
Herbert 2004	Canada	Ran-domised controlled trial	PHC	200 GPs in 28 pre-existing groups.	6 months, com-parison of data 6 months before and after the inter-vention.	Assess the impacts of individualised prescribing feedback. 4 groups: control, prescribing portrait only, educational module only, both portrait and educational module.	3 representative patient cases were discussed, evidence-based information to guide management. Facilitation ‘as usual’ in the CME group.	Histograms comparing an individual’s prescribing rates with those of the group and of all GPs in the study. A succinct evidence-based message to guide future prescribing.	The group that received both the module and the portrait had the greatest increase in preferred prescriptions.	

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Mc Vicar 2006	Scotland	Before-and-after study (pilot)	PHC	5 small groups, 7–9 GPs in each group	12 months	Assess effectiveness of the PBSG approach in developing participants' knowledge, skills and attitudes in interpreting, discussing and applying current medical evidence.	Facilitators establish and maintain a learning environment. They create a culture of openness, honesty and willingness to acknowledge unawareness as a precursor to learning.	Educational material, a tool that triggers reflection, discussion of personal experiences and acknowledge-ment of gaps between current and best practice.	The study was statistically underpowered. Participants highlighted general enjoyment, professional reassurance and personal learning.	Papers about Practice Based Small Group Learning in Canada, Scotland and England
Armson 2007	Canada	Description of the programme	PHC	4–10 GPs	Meeting of around 90 minutes once or twice a month	Identify gaps between current practice and best available evidence, to encourage reflection on individual practice, and promote changes in patient care, using an educational approach.	The facilitator's tasks are to focus discussion, to encourage the group to identify barriers to the implementation of new know-ledge and to establish a safe, supportive environment for learning.	Facilitation of discussions based on educational material and a tool (log sheet) that triggers reflection. The group starts with personal experiences and reflects on and acknowledges gaps between current practice and best practice.	Groups of various compositions function effectively in this particular small group environ-ment. If the facilitator lost the group's interest, disintegration of the group was likely.	

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Kelly 2007	Scotland	Qualitative study: semi-structured interviews	PHC	One-to-one interview to evaluate the process in 5 small pre-existing groups.	Interviews among partici-pants of the Mc Vicar 2006 study	Explore the perceptions and experiences of PBSG participants to gain an understanding of how PBSGL works.	Facilitator opens discussions, clarifies statements, summarises what was said and questions issues, creating a learning environment.	Case discussions make evidence-based material relevant to participants and stimulate reflection. Mutual learning is important. Discussing data with others stimulates reflection.	Participants joined PBSGL groups because of the need to update medical knowledge, to compare personal practice with peer practice.	Papers about Practice Based Small Group Learning in Canada, Scotland and England
Overton 2009b	Scotland	Qualitative approach: theory-driven framework developed by Chen and Rossi	PHC	19 GPs and practice nurses	Interviews among partici-pants of PBSGL groups	Study the experiences of GPs and practice nurses in PBSGL. Data sources: logbooks, e-mail, telephone conversations and one-to-one interviews.	Qualitative study of the process in PBSGL groups: Group cohesion grew and mutual emotional support increased. With increasing trust, open discussions were possible.	Qualitative study of the process in PBSGL groups: case discussions kept people going and different perspectives could be considered. Self-esteem increased, as did mutual respect.	Motivation for joining the groups: preferred learning style, keeping up to date, learning in multi-professional groups, group atmosphere. and increased self-esteem.	

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Cunningham 2011	Scotland	Qualitative study: focus group	PHC	Two focus groups of PBSGL facilitators.	Focus groups	Learn about motivators to become a facilitator in PBSGL groups.	Qualitative study of the process in PBSGL groups	Qualitative study of the process in PBSGL groups	Motivators to become a facilitator were positive past experience of group learning, willingness to learn skills and, the chance of career advancement. Support for facilitators after initial training was important.	Papers about Practice Based Small Group Learning in Canada, Scotland and England
Rial 2013	England	Before-and-after study	Trai-nee GPs in PHC	2 newly-founded groups of seven future GPs.	After 8 months, 4 meetings	Identify whether they were supported in making the transition from trainee to independent practitioner through attending PBSGL groups.	One group member was trained as a facilitator.	Canadian PBSGL approach was used	Improved ability to identify and use evidence in practice, shifting the focus from postgraduate exams towards 'real world' practice. The PBSGL groups still meet.	

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QCs in Canada										
Ioan-nidis 2007	Canada	Before-and-after study (pilot)	PHC	5 QCs, 52 physicians, GPs and some osteoporosis specialists	12 months	Assess whether use of QCs could improve family physicians' adherence to osteoporosis guidelines. 3 training meetings for the facilitators, 3 meetings for participants.	QC facilitators were local family physicians recruited and trained specifically to lead study meetings.	Educational material, interactive group meetings, use of local opinion leaders, audit and feedback, reminders, multi-professional collaboration, financial incentives and information distributed to patients.	The intervention seemed to be feasible and was well received among GPs. 84% agreed that the feedback helped them understand their current practice patterns and decide on areas that needed improvement.	Papers on guideline adherence using continuous quality improvement cycles in Canada.
Ioan-nidis 2008	Canada	Before-and-after study	PHC	340 participants (GPs) in 34 QCs and local opinion leaders	1 year	Increase guideline adherence concerning osteoporosis. 5 meetings (60–90 minutes) for two years.	5 educational meetings	As in Ioannidis 2007	Physicians' awareness of osteoporosis risk factors and appropriate bone mineral density testing increased.	
Ioan-nidis 2009	Canada	Before-and-after study	PHC	As in Ioannidis 2008	2 years	As in Ioannidis 2008	As in Ioannidis 2008	As in Ioannidis 2008	Guideline adherence increased	

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German QCs										
Szecse-nyi 1994	Germany	Before-and-after study	PHC	10 GPs	2 years	Observation of the initialisation and establishment of a QC. Monthly meetings.	Presentation round, discussion of possible topics, choice of a topic impacting all participants; a GP facilitates the process.	Setting priorities, analysing the situation, developing criteria for improving quality, analysis of present practice, general priorities for necessary changes, comparison with evidence-based literature, change of practice.	GPs are interested in everyday practice-related topics. The gap between existing knowledge and clinical practice is acknowledged.	Papers about establishing QCs in Germany: pilot stage.
Gerlach 1995	Germany	Survey among 138 QC participants	PHC	138 GPs taking part in QCs, 8–12 GPs in each one.	Not applicable	Evaluation of case-based QC process focussing on a topic.	GPs use their own medical records, patient data or video recordings as a basis for problem-based learning. Facilitation by a GP.	Case-based discussions may indicate a need to change everyday practice. Evidence-based material and/or local opinion leaders may contribute to the discussion and consensus finding.	79% of the GPs thought that cases from daily practice should be the starting point of QCs. The process led to locally adapted guidelines.	

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Hart-mann 1995	Germany	Controlled before-and-after study	PHC	2 QCs, 10 GPs in each group compared to control group	4 months. Evalua-tion after 5 meetings	Increase guideline adherence in diabetic care. Test training modules for facilitators (GPs).	2 GPs in each group received training in facilitating small groups.	Didactic techniques as in Gerlach 1995, role play to practise patient–doctor communication.	Guideline adherence improved compared to control group.	Papers about establishing QCs in Germany: pilot stage.
Murad 1998	Germany	Before-and-after study	PHC	1 QC including 10 GPs	12 months	Improve guideline adherence for patients with diabetes mellitus type 2. 23 existing QCs meeting once a month.	GPs use their own medical records, patient data or video recordings as a basis for problem-based learning. Facilitation by a GP.	Use of practice data, medical records and case discussions involving a local opinion leader.	According to QC documents, improved guideline adherence.	
Tausch 1995	Germany	Before-and-after study (protocol)	PHC	23 QCs, 10 GPs in each group	Evalua-tion over 18 months	Evaluate facilitators' manuals on different common diseases. 23 existing QCs met once a month.	The facilitators prompted and encouraged participants to identify common problems in their practice.	The manual may provide a starting point for developing consensus guidelines.	Evaluation on three levels: reasons for participation in QCs, usability of the manual, assessing behaviour change.	Papers about establishing QCs in Germany using manuals.

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Tausch 1996	Germany	Survey	PHC	25 QCs, 246 GPs	Evalua-tion after 12 months and 10 meetings	Capture the objectives of the participants. 25 pre-existing QCs met once a month.	As above	Case vignettes, discussion of adequate diagnostic and therapeutic procedures in relation to evidence-based material.	Reasons for participating in QCs: exchange among colleagues, improved self-confidence.	Papers about establishing QCs in Germany using manuals.
Tausch 2001	Germany	Before-and-after study	PHC	23 QCs, 243 GPs	Evalua-tion after 18 months	Evaluate reasons for participation, usability of manuals and assessment of behaviour change (self-reported improvement). To expand QCs within short time.	Voluntary participation in monthly meetings, 6–12 GPs in each group, trained facilitator.	Moderator-manuals that allow self-evaluation provide information about appropriate diagnostic and therapeutic recommendations for common diseases.	Reasons for participating: exchange of experiences among colleagues, increased competence and high level of satisfaction.	
Andres 1997	Germany/ Hessen	Controlled before-and-after study	PHC	32 GPs were grouped into 3 QCs promoted by the association of statutory health insurance	12 months	Evaluate the process in the groups after 10 meetings. Participating GPs exceeded average prescription costs.	Participants felt forced to join QCs to change their behaviour. They had to overcome the feeling of being controlled.	Case discussions, audit charts to analyse prescription habits, interactive learning, reflective thinking and consensus finding as to rational prescription practice.	66% reported change in behaviour. 22 of 27 wanted to continue with QCs.	Papers about establishing QCs in Germany using data on everyday practice to improve prescription patterns.

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Andres 2004	Germany/ Lower Saxony	Survey among 797 QC participants	PHC	648 out of 797 participants answered the survey	Evalua-tion after 1 year	Evaluate QC participants' experiences in QCs intended to improve prescription patterns.	7–10 GPs, monthly meetings, facilitator guiding through the process, support by academic staff members if necessary.	Case discussions, peer-led academic detailing allowing comparison with colleagues, reflective thinking, consensus discussions, evidence-based material, patient information.	Main problems were initial prescribing in hospitals and communication with patients when changing drugs.	Papers about establishing QCs in Germany using data on everyday practice to improve prescription patterns.
Wen-sing 2004	Germany / Saxony-Anhalt	Controlled before-and-after study	PHC	87 GPs in 10 groups of 7–12; control group: 90 GPs not participating in the intervention.	Evalua-tion after 2 years	Determine the impact of a large-scale programme of QCs on quality and costs of prescribing, 11 meetings of 2 hours, existing QCs promoted by the association of statutory health insurance.	A trained facilitator (GP) supported the group.	Structured feedback report, patient video, evidence-based material, interactive learning and reflective thinking about willingness to change.	High satisfaction with QCs. Prescriptions decreased in the intervention group while increasing in the control group. Aspects of quality of prescriptions improved.	
Andres 2004	Germany /Hessen	Survey	PHC	483 out of 612 GPs (57 QCs) answered.	Evalua-tion after 2 years	Evaluate participants' experiences of existing QCs taking part in a large project.	7–10 GPs in each QC, facilitator guiding through the process, support by academic staff members.	Personal prescription data with the opportunity to compare with colleagues.	Positive effects on medical practice and increase in knowledge.	

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Fessler 2006	Germany (Rhine Main)	Controlled before-and-after study	PHC	90 GPs participating in QCs were compared to non-participants in another area	Evalua-tion after 2 or 3 years	Improve prescription patterns concerning statins, antidiabetics, other drugs for cardiovascular diseases. Intervention in existing QCs.	Facilitated group work every 4–6 weeks.	QC process according to German standards; discussion of any results not in line with guidelines.	Guideline adherence increased.	Papers about establishing QCs in Germany using data on everyday practice to improve prescription patterns.
Papen-dick 2006	Germany (Rhine Main)	Controlled before-and-after study	PHC	59 GPs participating in QCs compared to 52 non-participants	Evalua-tion after 12 months	Examine the development of drug costs among GPs participating in existing QCs.	Facilitated group work every 4–6 weeks.	QC process according to German standards; discussion of any results not in line with guidelines.	The cost of medical drugs and the increase in expenditure were lower compared to the control group.	

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Wen-sing 2009	Hesse, Lower Saxony, Saxony-Anhalt	3 controlled before-and-after studies with baseline in 2001 and follow-up in 2003	PHC	1090 GPs in the inter-vention group and 2090 in the control group.	Baseline data 3 months; evaluation using another 3 months' data after 24 months.	Determine the effectiveness of the QC process on prescribing patterns in existing and new QC groups. Data were gathered on different groups of drugs. One QC meeting a month.	8–14 physicians in a group, trained facilitator (GP)	Repeated feedback on prescribing patterns, evidence-based information, reasons for variations were discussed, case-based discussions, objectives for improvement were formulated and specific plans made.	Attendance rate 71–79%, high satisfaction >80%. Reduction of mean prescription costs per patient, increased prescription of recommended drugs compared to the control group.	Papers about establishing QCs in Germany using data on everyday practice to improve prescription patterns.
Andres 2010	Hesse, Saxony-Anhalt, Westfalen-Lippe, Schleswig-Holstein	Interrupted time series 1995–2007	PHC	1242 QCs documented 27,255 meetings. Evaluation of QCs only if they meet at regular intervals and have done so for at least one year.	12 years	Assess the quality of the structure, processes and results of existing QCs promoted by the association of statutory health insurance.	Facilitators questioned the groups and tried to detail an agreement on best practice.	A group of GPs met at regular intervals to consider their standard practice. Their work was based on personal experience, own data and was target-oriented to promote quality in their own practice.	8 and 12 meetings per year, group atmosphere was generally very good; the proposed method was actually used in the groups; consensus was often achieved.	

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Beyer 1999	Saxony-Anhalt, Bremen	Cross-sectional survey	PHC	2412 out of 4270 answered	Not applicable	Analysis of demands and expectations on supporting institutions	Not applicable	Not applicable	GPs reported good emotional support from colleagues, improved professional self-confidence, but also fear of control and excessive demands.	Paper about evaluation of reasons for and against participation in QCs.
Aubke 2003	West-phalia-Lippe	Cross-sectional survey 1995–2001	PHC	520 QCs with 7350 participants: 3260 meetings were evaluated	5 years	Assessment of QI cycle in existing QCs using a checklist. 15 GPs in each group, meeting time 120 minutes on average	Not applicable	QCs work both continuous and topic-centred, based on documentation from own practice with the aim of promoting their quality of care.	29.6% of all QCs had implemented the PDCA cycle, 54.9% had partially implemented the characteristics.	Paper on QCs about evaluation of adherence to the PDCA cycle.
Beyer 2003	Germany and European countries	Cross-sectional survey among EQuiP delegates	Euro-pean PHC	Reports of EQuiP delegates from 26 countries	Cross-sectional	Provide an overview of QC activities across Europe.	Facilitator is usually a GP.	A consistent group of 8 to 15 health-care professionals meet at regular intervals to consider and reflect on their standard practice.	High activity of QCs (i.e. > 10% of all GPs are involved) in 9 European countries.	Paper about the spread of QCs across Europe (Update Rohrbasser 2019).

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Mols 2005	Germany (Black Forest region)	Controlled before-and-after study	PHC	36 GPs in QCs treated 75 patients, 25 GPs in the control group treated 51 patients	Baseline after 6 months, evaluation after 18 months.	Study the effect of existing QCs on secondary prevention of stroke.	Facilitated group work every 6 to 8 weeks.	QC process according to German standards.	QCs did not have an additional effect on secondary prevention after stroke compared to the control group.	Paper on QCs about testing guideline adherence.
Sch-neider 2007	Germany	Ran-domised controlled trial	PHC	12 QCs involving 96 GPs; out of 256 partici-pants, 185 responded to the follow-up.	Evalua-tion after 1 year	Evaluate the efficacy of QCs for asthma care working with individual feedback with and without benchmarking.	Trained facilitators supported the groups in the process.	Collective discussion of evidence-based pharmacotherapy and management of patients on the basis of prescribing data.	Both groups improved their guideline adherence.	Testing the question whether benchmarking in QCs improves guideline adherence - or not.
Vollmar 2007	Germany (North-Rhine West-phalia)	Protocol of a randomised controlled trial	PHC	174 GPs in approx. 20 QCs	Evalua-tion after 3 meetings (6 months)	Improve GPs knowledge and skills about people with dementia.	QCs are facilitated by a trainer rather than by a facilitator.	Study concept A: e-learning followed by case discussions in QCs. Study concept B: oral presentation of evidence-based information followed by a discussion led by a presenter.	Possible change of behaviour, use and acceptance of new learning tools.	Papers about evaluation of e-learning methods in QCs.

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Vollmar 2009	Germany (North-Rhine West-phalia)	Cross-sectional survey	PHC	264 out of 449 GPs answered the questionnaire	Cross-sectional	Gain understanding of German GPs' preferences for different forms of educational methods, such as e-learning.	Not applicable	Not applicable	Approx. 70% wanted to discuss everyday practice with colleagues. Meeting experts and e-learning were not favoured.	Papers about evaluation of e-learning methods in QCs.
Vollmar 2010	Germany (North-Rhine West-phalia)	Ran-domised controlled trial	Ger-man PHC	166 GPs in 26 QCs	1 year after study start	Compare knowledge acquisition about dementia management between blended learning and QC methods alone.	QCs are facilitated by a trainer rather than by a facilitator	Study concept A: e-learning followed by case discussions in QCs. Study concept B: oral presentation of evidence-based information followed by discussions in a QC.	Groups A and B improved their knowledge. A blended learning approach was not superior to the QC approach.	
Siebolds 2012	Germany	Survey	PHC	83 facilitators received survey	Cross-sectional	Evaluation of training and support for facilitators by tutors.	To support facilitators, the KBV (National Association of Statutory Health Insurance) developed structured didactic handouts for the QC work.	Guidelines of the National Association of Statutory Health Insurance for Quality Assurance Procedures.	High level of satisfaction with didactic handouts (manuals) and training opportunities.	Paper about the quality of training and support for facilitators.

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Swiss QCs										
Bugnon 2004	Switzer-land	Controlled before-and-after study	PHC	6–10 GPs in 1 QC.	Develop-ment over 3 years	Improve prescription patterns and reduce costs for drug prescriptions.	A pharmacist facilitated the group through the process of academic detailing. The group engaged in local networking. Group cohesion increased with time.	Evidence-based information, feedback on prescriptions including information about possible substitutions. Consensus discussions and agreement on best choices.	Improvement of prescription patterns (antibiotics, antidiabetic and antihypertensive drugs, NSAIDs); reduction of costs compared to control groups.	Papers about pharmacist-led QCs in Switzerland.
Niquille 2010	Switzer-land	Controlled before-and-after study	PHC	24 GPs in 6 QCs	Develop-ment over 9 years	Improve prescription patterns and to reduce costs for drug prescriptions.	A pharmacist facilitated groups of 3–6 GPs through the process of academic detailing. Group cohesion increased with time.	As in Bugnon 2004	42% decrease in drug costs, improved adherence to prescription guidelines compared to control group.	

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Drug Education Project										
Lund-borg 1999	Sweden	Ran-domised controlled trial	PHC	18 groups (104 GPs) compared with 18 groups (100 GPs), 3–10 GPs in each group	6 months	Improve the treatment of asthma and urinary tract infections. The two study groups served as controls for each other.	Pharmacists facilitated the GP groups, two meetings, each meeting 1.5 hours.	Information on their judgements of written simulated cases. Discussion of actual decisions taken on the simulated cases. Discussion of personal experience of difficult clinical cases and underlying reasons for prescriptions.	Guideline adherence increased for patients with urinary tract infections and patients with asthma.	QC study on improving drug prescriptions in Sweden, Norway, The Netherlands and Slovakia: Drug Education Project.
Lund-borg 1999	Sweden	GPs' evaluation of the trial: survey	Swe-dish PHC	82 out of 104 GPs and 83 out 100 GPs responded.	6 months	Capture GPs' experiences of the trial through a questionnaire.	As above in Lundborg 1999	As above in Lundborg 1999	87% of participating GPs wanted to take part in similar CME activities for other conditions.	
Lager-lov 2000	Norway	Ran-domised controlled trial	Norwe gian PHC	32 groups (199 GPs), 4–8 GPs in each group	6 months	As above in Lundborg 1999	As above in Lundborg 1999	As above in Lundborg 1999.	Guideline adherence increased.	

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Veninga 1999	Sweden, Slovakia, The Nether-lands	Evaluation of a randomised controlled trial	Swe-dish, Norwe gian, Dutch and Slova-kian PHC	The Netherlands: 24 groups, 181 GPs; Sweden: 36 groups, 204 GPs; Norway: 32 groups, 199 GPs; Slovakia: 20 groups, 81 GPs.	6 months	Explore whether a specific educational approach for implementation of guidelines has a similar effect when used in different health care settings.	As above in Lundborg 1999 (Slovakia only one meeting).	As above in Lundborg 1999	Attitudes changed and prescription patterns improved.	QC study on improving drug prescriptions in Sweden, Norway, The Netherlands and Slovakia: Drug Education Project (DEP).
Veninga 2000	The Nether-lands	Ran-domised controlled trial	PHC	24 groups (181 GPs)	6 months	As above in Lundborg 1999	As above in Lundborg 1999	As above in Lundborg 1999	Guideline adherence increased.	
European single studies										
Eliasson 1999	Sweden	Literature review, survey and authors' reflections	PHC	5–10 GPs in each of approx. 230 groups	Meeting once to twice a month	Give an overview of CME group work in Sweden and describe its strengths and weaknesses.	Facilitated group discussions. Reflection on emotional responses was part of the group process.	Prearranged modules with short introductions and facts on a topic. Discussions based on experiences.	80% of the group members assessed the pedagogical value of the group sessions as more valuable than direct instruction.	Paper on Swedish QCs

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Watkins 2004	England	Qualitative study: focus group	PHC	6 different facilitators with different backgrounds. A total of 19 GPs in four practices and one practice manager took part. 11 GPs were interviewed.	7 monthly sessions taking place at midday	Reflect on inappropriate and costly prescribing. Investigate feasibility of educational sessions for GPs: acceptability among GPs and possible barriers.	'Reflective practice' as a potential solution to high-cost prescribing. GPs felt that participation was to appease their prescribing adviser. No or little sense of ownership. Information overload was a problem.	Video-tape of a scenario, followed by brainstorming, and personal responses in the group. 'Best buy' response was selected. Identification of barriers to implementation and discussion of means to overcome barriers.	Low response for participation (4 out of 61 practices). There was friction between clinical autonomy and the experience of a top-down intervention.	Paper on English QCs (reflective groups)
Tonies 2006	Austria	Survey	PHC	In 2001, 29 GPs out of 169 (17%) responded; in 2002, 46 out of 272 (27%) responded.	Evalua-tion after 4 years of offering QCs	Improve care of patients with drug replacement therapy using synthetic opioids in PHC.	A GP facilitated the group and had the support of an experienced local opinion leader.	Local opinion leaders introduced topics. Stimulation of discussions to increase self-awareness and frustration tolerance.	High level of satisfaction with the teaching. Communication skills improved. Topic-specific knowledge increased.	Topic-specific QC activities in Austria.

Author year	Country	Study design	Set-ting	Participants, professional background	Study duration	Objective and intervention setting	Facilitation and group dynamics	Didactic and QI technique	Outcome oriented data	Common characteristics of the cluster (kinship)
Riou 2007	France	Controlled before-and-after study	PHC	Number of groups is not mentioned, 7–11 GPs per group, 24 participating GPs, 3–6 local pharmacists in each area.	12 months (Dec 2001 to Dec 2002)	Improve prescription patterns in three semi-rural areas of Brittany, France. Financial incentive.	4 plenary meetings with consultants lecturing on pre-specified topics. QCs every 6th week using personalised feedback.	Expert input during plenary sessions, voluntary feedback, peer review and specific recommendations for changes during QCs.	Increase in generic prescription rates and decreased prescription of drugs with no evidence-based efficacy.	French QC study on improving drug prescription patterns.
van Driel 2007	Belgium	Cluster randomised controlled trial	PHC	9 QCs (122 GPs) in the intervention and 9 QCs (134 GPs) in the control group	November 2004 to March 2005	Improve antibiotic prescribing in patients with rhinosinusitis. Existing QCs.	The group meetings were scheduled as regular QC sessions without the presence of an external expert.	Dissemination of the guidelines by e-mail; facilitators received educational material concerning antibiotics.	A single intervention in QCs did not have a significant effect on prescription patterns.	Belgian QC study on improving drug prescription.
Spiegel 2012	Austria	Qualitative evaluation	PHC	445 out of 821 GPs took part in the groups, 8–10 participants in each group	2 years: 2004 and 2005	Explore GPs' perception of QCs concerning prescribing habits. Qualitative analysis was used to evaluate QC protocols.	Facilitators' duties were to schedule dates for QCs, give introductory talks on intended topics and facilitate the group process.	Use of educational material on various issues of pharmacotherapy; costs were addressed; provision of personal feedback on prescription habits.	Prescription of generic drugs increased.	Austrian QC study on improving drug prescription.

Author year	Country	Study design	Set-ting	Participants, professional background	Study duration	Objective and intervention setting	Facilitation and group dynamics	Didactic and QI technique	Outcome oriented data	Common characteristics of the cluster (kinship)
OTHER AREAS										
de Villiers 2003	South Africa	Qualitative evaluation using Nominal Group Technique followed by survey	PHC	64 GPs answered (response rate 38%), 51 out of 101 responding GPs had participated in QC, 8 out of 12 facilitators responded	Evalua-tion of 9 months CME/ CPD activity	A nominal group technique was used to compose two questionnaires (for participants and facilitators)	Facilitated small-group activities	Activities built on previous experience, involved the learners, focussed on relevant problems; solutions were applicable in practice; the process followed a cycle of action-reflection and GPs acquired technical skills.	91% of the respondents indicated improved knowledge, 73% indicated improvements in their patient care and 61% improved clinical skills	South African QCs
Rich-ards 2003	New Zealand	Pilot study: retro-spective, controlled before-and-after study	PHC	52 GPs in small education groups: approx. 10 GPs in each group	After 1 and 2 years	Determine whether a QC-programme designed to promote rational GP prescribing succeeds in changing practice when added to audit and feed-back, academic detailing.	Meetings were monthly and group composition remained the same over time.	Control group: audit and feedback on prescription habits, academic detailing and educational bulletins. Intervention group: peer-led groups, monthly meetings.	Positive effect of the education strategy in groups compared to the combination of audit and feedback and academic detailing.	QCs on improving drug prescriptions in New Zealand.

Author year	Country	Study design	Set-ting	Participants, professional background	Study duration	Objective and intervention setting	Facilitation and group dynamics	Didactic and QI technique	Outcome oriented data	Common characteristics of the cluster (kinship)
Parker 2007	USA (Hawaii)	Ran-domised controlled trial	PHC	4 health-care facilities of similar size participated and were randomly assigned the local or the central QI approach	Duration about 2.5 years	Compare the participatory local approach with the central expert approach to QI in depression care.	Researchers allowed teams to design their own programmes. Local QI groups had a facilitator.	The QI teams followed guidance regarding team composition and process. The central expert approach used centrally organised teams of experts.	A hybrid model (central expertise and local participation) may be the most effective approach to maintain a high level of motivation.	QCs on Hawaii compared to centrally steered options.
Som-mers 2007	USA (Califor-nia)	Survey and attendance rate	PHC	Researchers invited 30 sites, 11 (103 GPs) out of 14 sites who started continued with their meetings	5 years	Introduce small-group meetings as means of managing clinical uncertainty.	A group member or an invited, external member facilitated discussions, searched for and appraised evidence and coordinated meeting logistics.	Reflection on and appraisal of one's own delivery of clinical care. Case-based discussion and reflection.	Most common themes: being with colleagues, the role of time in GP practice. Other common themes: acknowledging uncertainty, receiving validation.	Practice-Based Learning and Improvement in in California.
Murrihy 2009	Australia	Before-and-after study	PHC	6 groups of GPs (32 GPs)	6 months	Improve GPs' skills and actual use of cognitive behaviour therapy. 8 two-hour sessions.	Expert-led small-group interactive learning, and ongoing discussion of patients.	Development of mentor-type relationships, the use of interactive learning and skills-based training, discussion of ongoing patients.	GPs' knowledge, skills in and actual use of cognitive behaviour therapy increased.	QCs in Australia.

Author year	Country	Study design	Set-ting	Participants, professional background	Study duration	Objective and intervention setting	Facilitation and group dynamics	Didactic and QI technique	Outcome oriented data	Common characteristics of the cluster (kinship)
UPDATE December 2017										
Fisher 2013	North East Ohio, USA	Before-and-after study and survey (qualitative data)	PHC	78 participants in 20 practices/ groups; some groups were inter-professional	1 year	The American Board of Medical Specialties' Performance and Practice initiated the project to support GPs in working in groups to improve practice.	A coach facilitated the process, led discussions, helped the team to recognise their skills, to identify the next steps and to address problems arising.	Physicians discussed their priorities for improvement, narrowed the topic, reflected on results of patient surveys and shared their view of 'best practice' using personal examples.	Introduction of QI tools into groups succeeded. Participants felt that the group activity encouraged collaboration with colleagues.	Practice-Based Learning and Improvement in the USA.
Francois 2013	Isère, France	Survey	PHC	16 groups, 132 GPs	Not applicable	Review the implementation of QCs by mapping the groups, describe the perspective of participants and study how these groups work.	Facilitators helped the groups to share experiences and to discuss difficult cases and medical errors.	Case discussions, audit charts to analyse prescription habits, interactive learning, reflective thinking and consensus-finding, local opinion leaders.	6–10 GPs in each group, meetings lasted between 1 and 2.5 hrs, 6–10 meetings per year, participants had a high level of satisfaction.	Description of QC development in Isère, France.
Wilcock 2013	England	Cluster randomised controlled trial	PHC	11 practices using workshops, 12 practices usual care (NICE guidelines)	12 months	Test the effect of a tailored educational intervention on the clinical management of people with dementia.	Facilitated small-group workshops with practice teams.	Adult learning approach to solving real-world problems, tailoring the learning need, using workshops at the work place.	The intervention did not alter the clinical management of patients with dementia.	QC-like intervention in England testing guideline adherence.

Author year	Country	Study design	Set-ting	Participants, professional background	Study duration	Objective and intervention setting	Facilitation and group dynamics	Didactic and QI technique	Outcome oriented data	Common characteristics of the cluster (kinship)
Andres 2015	Germany	Focus group	PHC	12 health-care professionals	Not applicable	Evaluation of 20 years' QC work	Maintaining autonomy, self-determination of topics and the process in QCs ensure the practical rele-vance of topics and emotional engagement of participants.	Case-based learning among peers in a facilitated group process is key in the QC process.	Measures to support QC-work: evidence-based information and trustworthy prescription patterns.	20 years' experience of QCs in Germany
Dowling 2015	Ireland	Survey	PHC	96% of GPs participating in CME groups responded (1366), 146 groups	Not applicable	Investigate whether taking part in CME groups improves GPs' clinical knowledge.	A local, small-group setting provides live peer-group interaction, peer support and reflection on practice.	Face-to-face activities, multiple exposure, the use of multi-media and multiple education techniques.	97% stated that they want to improve their clinical practice, 86.3% agreed that taking part in CME groups is key for this.	QCs in Ireland
Ver-bakel 2015	The Nether-lands	A three-group cluster randomised controlled trial	PHC	10 groups in each intervention group	4 months	Assess the effect of two interventions on patient safety culture: a survey compared to adding a QC-like intervention compared to usual care.	Team-based reflection on personal practice data and team-based development of action plan.	Didactics were added to the experiential learning principles of Kolb, for example, concrete experience, reflection, conceptualisation, and experimentation.	Increased reporting of critical incidents	Dutch QC study on improving patient safety culture.

Author year	Country	Study design	Set-ting	Participants, professional background	Study duration	Objective and intervention setting	Facilitation and group dynamics	Didactic and QI technique	Outcome oriented data	Common characteristics of the cluster (kinship)
Mahlknecht 2016	Austria (Salzburg) and Italy (Tirol)	Before-and after-study	PHC	20 GPs in regional QC groups (number of groups not mentioned)	3 years	Assess whether quality can be improved by self-auditing, benchmarking and QCs.	Facilitated, regular group meetings	Critical self-reflection, audits and feedback, benchmarking.	The mean quality score increased significantly.	Austrian–Italian study using benchmarking in QCs.
Vervloet 2016	The Nether-lands	Controlled before-and-after study	PHC	4 groups (39 GPs) in the intervention and 4 groups (38 GPs) in the control group	1 year	Evaluate the effect of a multifaceted, peer-group-based intervention aiming to reduce respiratory tract related antibiotic prescriptions.	A series of regular meetings between GPs and pharmacists in the same catchment area.	Communication skills training, including communication about delayed prescribing, quarterly feedback figures for GPs.	Guideline adherence increased.	Dutch QC study on improving drug prescription involving pharmacists.
Jäger 2013	Germany	Protocol of a cluster randomised controlled trial	PHC	10 QCs (40 GPs)	6 months	To implement structured medication counselling, use of medication lists and medication reviews to avoid potentially inappropriate medication.	QC meetings every three months.	Development of individual concepts of change and their presentation at QC meetings. Posters and flyers for patients. Written feedback on individual practice patterns.	The degree of implementation of the three recommendations measured at patient level.	German QC study on improving drug prescription.

Author year	Country	Study design	Set-ting	Participants, professional background	Study duration	Objective and intervention setting	Facilitation and group dynamics	Didactic and QI technique	Outcome oriented data	Common characteristics of the cluster (kinship)
Jäger 2015	Germany	Description of intervention	PHC	12 GPs and 8 medical practice assistants from 8 practices participated in the workshop.	6 months	Describe the content and delivery of the tailored intervention.	No further mention of QCs in the paper.	Workshops about structured medication counselling, use of medication lists and medication reviews to avoid potentially inappropriate medication.	The workshop seemed to improve participants' knowledge of medication management.	German QC study on improving drug prescription.
Jäger 2017a	Germany	A cluster randomised controlled trial	PHC	Intervention group: 10 GPs in 5 different QCs; control group: 11 GPs in 6 different QCs,	6 months	As above in Jaeger 2013	Not mentioned	Training for GPs and medical practice assistants, educational material for patients, individually developed action plans, written feedback on prescription patterns.	Little or no effect of the tailored programme on the combined primary outcome could be substantiated. Lack of statistical power to detect any effect.	
Jäger 2017b	Germany	Interviews	PHC	Analysis of 12 interviews, 21 question-naires, 120 documenta-tion forms.	Evalua-tion of 6 months' study	To evaluate the study Jaeger 2017 using various data sources.	Facilitation or group dynamics were not described as QCs were not used as planned.	Workshop-like atmosphere of one meeting.	Patients were not able to use the tablets provided. Participants suggested integrating the training into QCs.	

Author year	Country	Study design	Set-ting	Participants, professional background	Study duration	Objective and intervention setting	Facilitation and group dynamics	Didactic and QI technique	Outcome oriented data	Common characteristics of the cluster (kinship)
Ter Brugge 2017	The Nether-lands	Mixed-methods design: question-naire about types of group meetings followed by interviews	PHC	78 out of 128 GP supervisors filled out the questionnaire; 18 GP supervisors were interviewed	Not applicable	Examine different types of group meeting and explore the use of clinical research evidence.	Little discussion on clinical applicability of evidence.	Guidelines, local opinion leaders who lecture, consensus discussion.	QCs are the type of group meeting that occur most often in PHC. They seem to be more goal-oriented than learning-oriented. The agenda was heavily influenced by health insurance companies.	Dutch QC study on improving drug prescription involving pharmacists.
Trietsch 2017	The Nether-lands	A cluster randomised controlled trial	PHC	21 QCs (197 GPs)	3 years	Test the effect of audit and feedback with peer review on GP' prescribing and test-ordering performance.	Facilitation by local opinion leaders (laboratory specialist or local pharmacist) who were trained in a three-hour meeting. The groups met twice for each topic.	Facilitators had written and digital evidence-based materials, individual feedback reports	The increase in total tests ordered was 3% in the intervention and 15% in the control group. The increase in prescriptions was 20% in the intervention and 66% in the control group.	Dutch QC study on improving test ordering and drug prescription.

The remainder of this section describes the findings of my analysis and the synthesis of the literature review. I will present my findings in a narrative summary that describes part of the programme theory, based on the data in the literature and will then provide a realist analysis containing one or more CMO configurations. Finally, I will present illustrative examples of quotations from the literature that underpin the sequences of the CMO configurations. Some CMO configurations are supported by many quotations, others only by few. The relevance and rigour of the supporting quotations is more important than their number (see Chapter Four/Phase III). The full list of quotations supporting the CMO configurations is shown in Appendices 8.1 and 8.2.

Introduction of the Programme is key because the literature indicates that GPs and other health-care professionals are not necessarily familiar with concepts of quality in PHC. They may not know what a QC is or how it functions. Surveys revealed that few health-care professionals understood the working methods and objectives of QCs (e.g. the educational rationale or QI). This lack of knowledge could lead prospective participants to misjudge or misunderstand QCs, and participants should, therefore, be informed in an introductory meeting what to expect and how they can contribute to QI with their expertise, to encourage them to approach QCs with a positive attitude. Participants should also discuss any negative experiences they have had with similar management interventions, and also cover meeting frequency, time requirements, venues, expectations of professional organisations or health insurance companies and the support they may offer to QC members. This enables the participants to reflect on and consider their role in QCs and, thus, develop a positive attitude towards QI and QCs. As GPs prefer to be self-determined and work independently, national legislation and regulations should entrust them with QI to increase their motivation to start QCs. I have presented the realist analysis in Table 8.3.

Table 8.3 Realist analysis – preconditions for the QC programme

CMO configuration 1: **'participants know what to expect'** If the introductory workshop teaches the principles of QI in PHC and illustrates how QCs work (C), then potential members may be more willing to join QCs (O) because they know what to expect and feel that they can meet expectations (M). *Surveys have revealed wide-reaching gaps in information, some of which are the cause of misunderstandings and misjudgements. In particular, the working methods and objectives of medical quality circles are apparently insufficiently known. Better general information on this subject, which contracted doctors, in particular, expect from their KV [health insurance company], is therefore urgently needed. As examples from the Netherlands and Great Britain show, active information from the target group is a basic prerequisite for quality-enhancing measures in practice [translated from German] (Beyer et al., 1999).* *Introduction of the model … is important for understanding and helps participants during the start of the process. It was also vital to have a common and shared understanding of the problem among participants. It is worthwhile taking the time for an agreement on shared guidelines … (Welschen et al., 2004).* *To deal with these issues [information overload], an initial, introductory session of 'Reflective Practice' needs to be included, where GPs' experience of previous prescribing management interventions can be aired, where safe 'rules of engagement' can be agreed, and the purpose of the 'reflective practice' intervention made explicit (Watkins et al., 2004).*
CMO configuration 2: **'need for autonomy and obligation'** If the administration at national level or at the level of health insurance companies entrusts GPs with QI and autonomy (so they can decide how to implement it) (C), then GPs might participate in QCs (O) because they feel they can take on the responsibility and make a difference (M). *In the discussion with facilitators, the QC participants expressed their desire to be self-determined and work independently. For this reason, the Federal Association of Statutory Health Insurance Physicians (KBV) and the Associations of Statutory Health Insurance Physicians (KVen) have laid down the thematic and methodological autonomy of QCs as a prerequisite in their guidelines for quality-circle work and have committed themselves to supporting them [translated from German] (Siebolds et al., 2012).*

The literature describes forces that influence, at different levels, the reasons **why GPs decide to meet and build groups**. At the individual level, GPs and other health-care professionals have similar needs. QCs enable GPs to share and compare their practice with each other; researchers often claim this is their initial motivation for joining. GPs want to exchange ideas and discuss current trends with colleagues rather than listen to experts or read a book. Multiple sources claim that GPs rank QCs as their preferred learning style and that QCs help them to maintain their clinical practice up to date. Many GPs have to recertify, and in certain countries CME credits from QCs contribute to this process. At the organisational level, health insurance companies may require

physician networks and associated health-care professionals to continually check and improve their quality of work. Literature on the effect of national-level bureaucracy on QC participation is scarce, but evidence suggests that administrations should entrust GPs with QI because GPs' motivation to participate in QI is lower when this trust is absent. The literature states that, in order to stimulate QC work, local or national organisations should provide support and venues for QCs and protected time for participants, with other professionals taking on their immediate tasks during QC sessions. Organisations should also provide support to participants for gathering data or providing evidence-based information without interfering with the QC process. Finally, they should organise the training of QC facilitators and supervise them.

Establishing a group is a precondition for QCs, according to the literature. Facilitators play a crucial role in forming and norming groups. The first few times that a group meets serve to connect participants and introduce people to each other, allowing them to engage in socially enjoyable contact. Facilitators help the group decide on its norms by discussing and developing rules and routines with the participants, which then give the QC its identity. They foster a safe environment, characterised by trust between members. Frequent enjoyable activities, such as sharing meals or talking about daily experiences provide social benefits and create a congenial atmosphere in which frank and open discussions can take place between equals. Peers must trust each other before they can be honest in their discussions. QCs should have a flat hierarchy, and members usually choose their own facilitator. The group must control the learning process if it is to remain motivated and find the QC meaningful. The group develops further when participants choose their own topics and methods for promoting quality. The number of participants influences communication within the group, and the literature suggests that groups of between 5 and 12 participants are optimal. I have presented the realist analysis in Table 8.4.

8.4 Realist analysis – establishing the group as a prerequisite for the quality circle process

CMO configuration 3: **'sharing similar needs'**

If the administration at the organisational level of QCs provides support (i.e. in training facilitators, data gathering, provision of evidence-based information), and the administration protects time and space and offers CME points and small financial incentives to QC participants (C), then the latter will meet in groups to exchange ideas (O) because GPs prefer learning in QCs (M); support generates positive expectations among participants (M) and GPs believe that QC meetings with their peers will be useful (M).

External staff should organise QCs as facilitators have too little time to do this [translated from German] (Beyer et al., 1999).

The most-cited reason for joining Problem Based Small Group Learning (PBSGL) …… their preferred learning style. 'I find my preferred method of learning to be in small groups and case-study discussion, so this programme seems ideal for my learning needs' (Overton et al., 2009b).

To ensure attendance in the future, the educational sessions need to be protected by the use of a paid locum, in the same way as other practice development work is now being supported (Watkins et al., 2004).

CMO configuration 4: **'need for relatedness'**

If a regular group of members engages in socially enjoyable contact, led by a skilled facilitator who, e.g. introduces people to each other, opens discussions, and clarifies and summarises statements (C), then group members will get to know each other and decide on rules that they are willing to follow, building a safe environment based on trust (O) because members want to be among and to interact with equals (M).

We estimate it took three to four sessions for the group to be comfortable with this process. Open discussions and debates then came more freely, and the group continued to gel (Peloso and Stakiw, 2000).

Interestingly, the stage of storming, which is characterized by interpersonal hostility and conflict, was not evident in either group (Overton et al., 2009b).

The role of the facilitator has been recognised. They need to be competent at many tasks including opening the discussion, clarifying, summarising, questioning and devising strategies to improve group function (Kelly et al., 2007).

GPs regard the group as a place for social support, … growth in the professional role … for protection against burnout. Although … main purpose of small-group work is exchange … of knowledge, social aspects should not be neglected because they will increase the motivation to continue with meetings …. (Eliasson and Mattsson, 1999).

The success of group learning between GPs within a practice depends to a large extent on the quality of relationships within the group. Where individuals feel that their management decisions are under threat from colleagues with whose judgements they are not comfortable, discussion may be abruptly curtailed (Watkins et al., 2004).

CMO configuration 5: **'need for autonomy and control'**

If the group members choose their own topics and facilitator (C), then they will feel they own the QC (O) because their need for autonomy - a feeling of being in control of their own behaviour - is satisfied (M).

Tutors did not consider themselves as 'experts' but as 'one of them'. Being open about their background as GPs was an agreed-upon strategy, and tutors deliberately tried to avoid being perceived as experts. The tutors experienced that their own background was important for GPs' trust and acceptance (Frich et al., 2010).

The facilitator is selected by the group (Armson et al., 2007).

It is important for a learner to be in control of his or her learning process, to be motivated and to perceive meaningfulness (Lundborg et al., 1999a).

… the rise of evidence-based medical guidelines probably decreases individual providers' autonomy. Physicians have raised similar concerns about threats to the autonomy of their profession …. … It is within this context, … declining perceived autonomy for … physicians, that we compare the participatory local and central expert approaches to QI (Parker et al., 2007).

CMO configuration 6: **'size of the group affects communication'**

If the group size exceeds 15 (C), then interaction among group participants decreases (O) because participants cannot keep up with each other and follow all conversations (M).

All GPs participating in such peer groups, on average consisting of six to eight peers, located in southern Norway (Straand et al., 2006).

How can QCs be supported? (Table 2) Group sizes > 15 or < 5 - are problematic and participants need support [translated from German] (Andres et al., 2010).

The effect of the educational asthma programme was partly modified by the group size; prescribing behaviour for [asthma] exacerbations improved more in smaller groups. The group size varied from 4 to 13…. This result is … an optimal group size of 5 to 6 group members (Veninga et al., 2000).

Evidence from the literature indicates that, once the group has built a safe climate where participants provide mutual emotional support, a skilled facilitator can create an **environment where they learn from each other** through confrontation and feedback. QC facilitators encourage participants to tell their own case stories early on. They embolden participants to join in and respond interactively, respecting each other's contributions. Facilitators use active listening skills to encourage participants to reflect on their case stories and look at them from different perspectives. Active listening stimulates colleagues to share their knowledge as stories and share their own relevant experiences. GPs are keen to discuss their professional values with peers who

understand their mission. Listening to each other's stories makes participants more aware of their own and others' knowledge; GPs can shape their professional identity and gain trust in their professional role. They may also better understand their learning needs and choose relevant topics to address. The opportunity to share successes and failures in a safe environment involves participants in the process and the learning process in QCs starts with personal experience. In experience-based learning, participants take an active role: they think about their own actions and try to solve real problems. This self-directed approach provides immediate benefits to participants and appears to bring considerable satisfaction. When participants compare the treatment of specific cases, their implicit knowledge (being able to do it but without being able to say how) becomes explicit (knowledge communicable by means of language or signs) so they can consciously reflect on it. The literature indicates that the use of trustworthy data on one's own practice (e.g. diagnostic habits or prescription patterns), evidence-based summaries or articles, or input from local opinion leaders can stimulate practitioners to reflect on their own practice. For example, discussing results with colleagues teaches participants about the practices of their peers. Facilitators use didactic techniques such as brainstorming, contentious or consensus discussions, or role play to keep the group active. They maintain a learning environment in which group members can exchange knowledge and reward exploratory behaviour. I have presented the realist analysis in Table 8.5.

Table 8.5 Realist analysis – creating a learning environment

CMO configuration 7**: 'feeling safe and not vulnerable'** If participants trust each other (C), then they can describe how they work and admit what they do not know (O), because they feel safe rather than vulnerable (M). *In time, group members develop confidence and security in the group, rendering the disclosure of ignorance and 'blind spots of knowledge' easier. Group members could either use the whole group or parts of it to assess their own learning needs (Eliasson and Mattsson, 1999).*
CMO configuration 8: **'need for competence and self-actualisation'** If the facilitator supports the participants and encourages them to tell their stories and share their experiences in a safe environment, e.g. by encouraging interactive responses, through discussions and by summarising statements (C), then participants will become involved and share their positive experiences and failures (O) because they want to improve their professional competence (M), gain professional confidence (M) and fulfil their professional potentials (M).

Subjects, topics and cases discussed in groups come from daily work and are highly relevant to practice. The small group will meet the demands of developing generalist knowledge as well as the expert role in general practice (Eliasson and Mattsson, 1999).

Small groups will have opportunities to discuss the 'art of medicine', founded upon context, anecdote, patient stories of illness and personal experiences. Accepting emotional responses being mirrored by other group members corresponds in some respects to the process in Balint groups (Eliasson and Mattsson, 1999).

Comparison with one's peers was important, as was the support, confidence and reassurance that some gained from being part of the group (Kelly et al., 2007).

Exchanging experiences in QCs, GPs can work out and clarify the characteristics of general practice, which improves knowledge transfer [translated from German] (Tausch and Harter, 1996).

'It [the role as a facilitator] gives you licence to play devil's advocate as well and challenge people a bit more whereas, if you were always doing that as just a group member, people might think you were just doing it to annoy them' (Cunningham et al., 2011).

CMO configuration 9: **'previous knowledge is activated'**

If participants exchange case stories and experiences while actively listening to each other in the presence of a skilled facilitator in a safe environment (C), then they will share their knowledge by telling their own relevant stories (O) because the process activates knowledge they already possess (M).

The use of a case-based format encourages activation of previous knowledge, allowing better retrieval of knowledge in the clinical setting…, particularly when it involves participation in small peer groups that foster trust, promote discussion of evidence relevant to real cases and provide feedback on performance (Armson et al., 2007).

During discussions at the level of relationships [case discussion], the exchange is more intense than in the exchange of pure facts; one's own behaviour is better analysed and suggestions arose for training in one's own practice [translated from German] (Murad, 1998).

Virtually everyone participates in presenting a case, asking for advice or clarification, or describing their practice patterns (Peloso and Stakiw, 2000).

CMO configuration 10: **'immediate relevance for the practice'**

If QCs use the technique of experience-based learning (C), then knowledge becomes more relevant to GPs (O) because it relates to their everyday work and they can use it immediately (M).

To better support PCPs (GPs) in managing uncertainty, more meeting time should be spent on the deliberate practice of blending evidence with experience (e.g. per-case, focused analysis of guidelines/relevance) and using case follow-up insights to 'reconstruct practice' for the individual patient while appreciating implications for the clinic/office …(Sommers et al., 2007).

There also must be some motivation for learning and change: this can be ensured if the issues discussed are derived from the learner's own clinical practice (Peloso and Stakiw, 2000).

The decision to focus on clinical problems instead of tests was a good choice, since it allowed the feedback and group work to be linked to national evidence-based guidelines. GPs appreciated this approach, because it was also closely related to their everyday work routine (Verstappen et al., 2004c).

By discussing specific cases, real problems in participants' everyday practice become the topic of discussion in QCs instead of designed problems. In systematic reconstructions [of patient situations], the experiences are made conscious, so that intuitively applied – implicit – mental guidelines can be made explicit [translated from German] (Gerlach et al., 1995).

CMO configuration 11: **'cognitive dissonance'**

If participants discuss and reflect on their work processes (e.g. based on trustworthy data or personal experiences) during a professionally facilitated exchange of positive experiences or failures (C), then they discover knowledge gaps and identify learning needs and relevant topics (O) because their own attitudes and behaviours may differ from their peers', creating cognitive dissonance (a negative emotional state triggered by conflicting perceptions) that makes them reconsider their own way of working (M).

During the meetings, the treatment of these specific patient records was discussed, especially differences between what was prescribed according to the records and what was actually dispensed (Lundborg et al., 1999a).

One of the key features of QCs is that working methods map the quality of care in one's own practice. First of all, this distinguishes QC work from further training in the classical style and second, it enables participants to identify real quality problems in their own practice [translated from German] (Andres et al., 2010).

The combination of the written simulated cases with actual prescribing allows the GPs to reflect on their decisions as well as the background for these decisions, and is in line with suggestions to make drug utilization studies closer to the reality of practice (Lundborg et al., 1999a).

Through reflection, a gap between current practice and best practice is recognized. Distinguishing this gap presents an opportunity to identify learning objectives specific to the family practice setting (Armson et al., 2007).

Our results are in concordance with research that suggests that GPs may feel disappointment if their prescribing practice conflicts with their ideals (Frich et al., 2010).

CMO configuration 12: **'social learning'**

If the facilitator uses purposeful didactic techniques (e.g. brainstorming, contentious or consensus discussions, or role play) to keep the group active and to reward exploratory behaviour during reflection on the work process (C), then the group will create a learning environment that promotes knowledge exchange (O) because learning is a cognitive process in which participants observe and imitate their peers' behaviour to gain social approval (M).

The participating GPs experienced the CME group meetings as an important arena for learning. They reported picking up good advice from others and learning practical alternatives …. GPs said their prescription data would not mirror all learning effects: 'The whole point is to reflect more …' (Frich et al., 2010).

Once the problem is acknowledged, one must learn and understand what caused the problem and how it can be solved. For this, elucidating and discussing the decision process underlying treatment decisions may be useful. To accept new information or practice recommendations, the credibility of the source is of importance (Veninga et al., 2000).

Cooperative learning can increase flexibility and joy in medical action (everyone learns from everyone) [translated from German] (Tausch and Harter, 1996).

Learning from and with colleagues is an important source of both new information and strategies for applying that information to practice (Armson et al., 2007).

Cognitive feedback is feedback on the decision process, i.e. why or how a decision is made and not on the decision itself, i.e. which decision is taken (Lundborg et al., 1999a).

A few authors describe how QC participants **adapt or create and test new knowledge** that originates from what they learn from each other. Health insurance companies have contracts with physician network organisations that require GPs to continually improve their quality of care. The literature suggests that the interaction between the health insurance company and QCs creates a tension between professional autonomy and obligations towards both the company and the patients. Physician network organisations must balance professional autonomy and stimulation to improve performance if they want to keep QC participants engaged. If GPs feel that their professional autonomy is threatened, they lose the motivation to participate in QCs. However, in a well-facilitated and safe learning environment, participants will see themselves as similar – in the same boat – and cooperate to reach a common goal in this situation of conflicting loyalties.

Didactic techniques such as contentious discussions or consensus efforts can help participants to decide which aspect of quality they want to improve by encouraging them to adapt and generate new knowledge for local use. Participants are more likely to implement new knowledge if they first identify and address the barriers to change, whether these are at a personal or a practice level. When the group creates new knowledge and implements strategies, the satisfaction of its members increases; they feel a sense of community and ownership and see themselves as competent and in control. Some authors consider a commitment to change to be an important precursor for its implementation, probably because committed participants favour change and believe they can put it

into practice. They also assume that their peers expect them to favour change. QCs are an ideal 'playground' for testing new knowledge: participants can try out new knowledge and new skills in a relaxed environment and gain confidence in their new abilities. The critical tasks of the facilitator are to focus discussion on real practice issues and to encourage participants to identify the factors that assist or hinder the implementation of new knowledge or skills into their individual practice. To fulfil this role, facilitators must maintain a safe, supportive environment that encourages the discussion of sensitive patient-care issues. I have presented the realist analysis in Table 8.6.

Table 8.6 Realist analysis – adapting, creating and testing new knowledge

CMO configuration 13: **'positive interdependence between health insurance companies and GPs'** If physician network organisations require continuous QC activities (C), then QCs will negotiate priorities and design creative solutions (O) because the tension between autonomy and obligation spurs the group to act and negotiate together to reach a common goal (M). *The physicians in the Rhine-Main network of physicians committed themselves to participating in QCs when they joined the contract. In QCs, they discuss prescription patterns for specific clinical situations and adapt guidelines to local conditions [translated from German] (Papendick et al., 2006).* *The participation of German GPs in QCs is mandatory in order to be part of government-funded disease management programmes (DMPs) or to be part of pilot projects with health insurance funds (Vollmar et al., 2010).*
CMO configuration 14: **'threat to professional autonomy'** If GPs feel that the QC programme is only a top-down managerial intervention to reduce costs (C), then they will not be motivated and will not participate (O) because they feel unsafe and fear they lack autonomy in their clinical role (M). *GPs and facilitators pointed to the difficulty of reaching consensus on a best buy…. Some found the term 'off-putting' because of its financial connotations. This suggests that some GPs may feel that their management decisions should be based on wider considerations than those of cost-effectiveness (Watkins et al., 2004).* *GPs were also unlikely to take part if they felt that the sessions would make them feel unsafe or if they felt that the sessions were yet another 'top-down' managerial intervention, where the main intention was to reduce prescribing costs (Watkins et al., 2004).* *The majority of respondents in both regions expected to benefit from participation in QCs but were unwilling to accept the risk that QI could be misused for control or cost reduction [translated from German] (Beyer et al., 1999).*

CMO configuration 15: **'positive interdependence among group members'**

If participants maintain an atmosphere of trust in a learning environment that promotes the exchange of knowledge, assisted by facilitators who use professional techniques (e.g. contentious discussion, reaching consensus and role play) (C), then participants will adapt and generate new knowledge for local use (O) because they see themselves as similar, and so act and negotiate cooperatively to reach a common goal (M).

The acquisition of new knowledge, skills, and approaches to bridge this gap follows. Often, however, access to new information alone is not sufficient. Reflection and discussion are necessary to help physicians 1) identify areas where current practice requires change and 2) develop strategies to integrate this new approach (Armson et al., 2007).

There was widespread agreement that the principal requisites for a good facilitator were experience and competence in small-group skills. One facilitator identified another skill: 'You've got to be able to hold the tension between comforting and challenging' (Kelly et al., 2007).

The personal interaction and mutual influence between colleagues implicitly resulted in an individual or group contract (Verstappen et al., 2004a).

Psychological research into group behaviour has produced an inventory of factors that influence conformity with group standards. Unanimity provides more pressure to conform, while privacy makes it easier not to (van Eijk et al., 2001).

CMO configuration 16: **'identifying and removing barriers to change'**

If participants, supported by skilled facilitators, address barriers to change (C), then they are more likely to implement the innovation (O) because participants help each other to develop strategies to identify and overcome these barriers (M).

Barriers within doctors relate to competence, motivation and attitudes, and personal characteristics such as learning style, whereas barriers within practices exist as doctors do not work entirely independently (Veninga et al., 1999).

Within the group, members endeavour to identify specific barriers to these practice changes and to formulate implementation strategies to facilitate desired changes (Armson et al., 2007).

The implementation of new knowledge is facilitated by expressing and discussing how to overcome obstacles to its acceptance (van Eijk et al., 2001).

CMO configuration 17: **'need for competence, autonomy and relatedness'**

If participants create new knowledge and plan an implementation strategy (C), then they feel satisfaction, responsibility and stewardship (O) because this fulfils their need for competence (being able to achieve specific objectives) (M), autonomy (a feeling of being in control of their own behaviour) (M), and relatedness (a sense of connection to a larger group) (M).

The decentralised approach at a local, internal level includes participants gathering experience from daily practice and formulating a feasible consensus solution. The advantage of this method is that GPs are actively involved in this process and therefore motivated to implement the (newly) developed guidelines. In addition, the participants involved will be more likely to accept (new knowledge) and feel committed to implement it [translated from German] (Tausch and Harter, 1996).

Potential advantages of the local approach: it promotes buy-in, maximizes fit to local culture and circumstances, maximizes the ability to work out the details associated with implementation, and produces a highly rewarding experience (Parker et al., 2007).

CMO configuration 18: **'intention to change'**

If participants publicly announce their intention to change (C), then they are more likely to implement the change (O) because they and others in the group all think it is a good idea and believe they can carry it through (M).

I was surprised to see how willing people were to reflect on their own behaviour and practice e... and constantly make comments like: 'Well, did I really do that? I surely have to pull myself together'. Very strong will, apparently, to make changes (Frich et al., 2010).

The third was the development of individual and group plans for change, to stimulate GPs to really put their plans into daily practice (Verstappen et al., 2004c).

Groups can be more effective in accomplishing tasks, and publicly announcing behavioural changes results in more commitment than private change (van Eijk et al., 2001).

… draws on 'the theory of planned behaviour' and other studies that have identified the pre-requisites of successful behaviour change in general practice reviewed by Veninga et al. 2000 (Watkins et al., 2004).

CMO configuration 19: **'testing new knowledge'**

If participants validate and test new knowledge in a QC, moderated by a skilled facilitator in a safe environment (C), then they feel confident putting that knowledge to use in everyday practice (O) because they have had the opportunity to practise and familiarise themselves with the innovation (M).

Interactive approaches, however, can be effective, particularly when they involve participation in small peer groups that foster trust, promote discussion of evidence relevant to real cases, provide feedback on performance, and offer opportunities for practising newly learned skills (Armson et al., 2007).

Understanding application of new knowledge. The discussions helped members to consider translating evidence into practice: 'Sometimes you can read about things but are unable to see how to put it into practice and I feel PBSGL enables you to think how you can do that' (Overton et al., 2009b).

Next, they examined empirical evidence concerning the validity of these solutions. To facilitate this process, teams had access to the large resource library that the research team had assembled (Parker et al., 2007).

An iterative process in a steady group promotes the implementation of new knowledge into practice. Participants repeat the steps of implementing an innovation several times, gaining confidence in the innovation or change of behaviour and improving their skills in handling the new situation during each repetition. One meeting is not sufficient to change treatment routines; it takes several rounds of discussions and feedback of trustworthy data to change routine behaviour. Participants gain expertise in their QC skills when they repeatedly use their didactic techniques and tools and complete the cycle of QI. There is evidence that 'practice makes perfect'. I have presented the realist analysis in Table 8.7.

Table 8.7 Realist analysis – repeating the process

CMO configuration 20: **'gaining confidence in an innovation'** If the group repeatedly practises implementing and adjusting to an innovation (C), then its members trust their own competence and turn the innovation into a habit (O) because successful outcomes increase their confidence in their abilities (M). *One meeting may not be enough to actually change treatment, although that is the usual procedure in the peer review groups. Behavioural theories stress the importance of repetition, especially for changing routine behaviour (Welschen et al., 2004).* *In general, GPs were excited to find in the second year that they had indeed changed in accordance with their plans, and they were then usually more motivated to implement further changes (Verstappen et al., 2004c).* *These results demonstrate the need to look at repeating/reinforcing messages at 12–24-month intervals (Richards et al., 2003).* *The constant feedback on progress achieved and the further possible improvements are other success factors (Niquille et al., 2010).* *The intervention comprised repeated feedback on prescribing routines and an intensive programme of educational small group sessions, as described by Bahrs et al. (2001) (Wensing et al., 2004).*
CMO configuration 21: **'repetition priming and automaticity'** If participants build a regular group and practise using QI tools (C), then they will successfully implement new knowledge into everyday practice (O) because responses improve with repetition: 'practice makes perfect' (M). *Practitioners develop expertise when they move from their comfort zones to examine problems 'at the upper limit of the complexity they can handle'; they learn, and iteratively gain mastery through cycles of reflecting on practice, obtaining feedback, and adjusting performance (Sommers et al., 2007).*

The benefit from participation depended significantly on the frequency of the meetings. Successful projects might not only positively reinforce the introduction of continuous QI, but could also bring about a positive attitude to the other aspects of systematic and continuous quality improvement (Geboers et al., 2001).

Real improvements to performance in daily care can only occur if there is an ongoing and regular quality circle process (Aubke et al., 2003).

Interviews and focus groups: refining the literature-based programme theory

I used data from **interviews** with stakeholders (Phase III) to examine the preliminary programme theory found in the literature. Participants responded to questions of how and why specific CMO configurations are successful in QCs by sharing examples or exploring mechanisms. Accordingly, I used these data to test each CMO configuration for its configuration, interpretation, underlying mechanisms and time relation to others. Where necessary, I have presented the necessary changes or introduced new CMO configurations in the light of the data from the interviews and focus groups. I have included all quotations in Appendix 8.3, and presented the summary of all the resulting CMO configurations (i.e. from the literature and interviews and focus groups) in Table 8.1. Interviews were in Swiss German, so I cannot translate verbatim, but my translations are as close to the content of the original quotations as I could manage. See Appendix 8.3 for all sources and quotes for each CMO configuration.

In the following section, illustrative quotes drawn from the interviews and focus groups are provided to show how they support each of the CMO configurations derived from the realist review. New CMO configurations are clearly indicated and may also be found in the section below. There were few quotes on the introduction of QCs; all interviewees agreed on the importance of a general understanding of what quality in PHC means and how a QC functions. Without this basic understanding, they thought that future QC participants might misunderstand QCs or have false expectations. The interviewees believed that they, as GPs, were in a better position if the national bodies entrusted them with QI and they were responsible for quality development themselves. As a

precondition, they emphasised that a physician network organisation or professional association should be sufficiently flexible to allow local QCs to implement their plans. This component of autonomy and control would make the QC group feel that they had a say and a job to do. I left the CMO configurations in Table 8.3 unchanged and developed an additional CMO configuration at the organisational level to account for the interview data. Illustrative examples of the data from the interviews and focus groups that support the literature-based CMO configurations are shown in Table 8.8.

Table 8.8 Realist analysis – preconditions for the QC programme

CMO configuration 1: **'participants know what to expect'** If the introductory workshop teaches the principles of QI in PHC and illustrates how QCs work (C), then potential members may be more willing to join QCs (O) because they know what to expect and feel that they can meet expectations(M). *So, I think that everything should be well organised and planned, and that you really have to understand what it's all about – as far as you can understand it without having gone through the process at least once [translated from Swiss German] (2).*
CMO configuration 2: **'need for autonomy and obligation'** If the administration at the national level or at the level of health insurance companies entrusts GPs with QI and autonomy (so they can decide how to implement it) (C), then GPs might participate in QCs (O) because they feel they can take on the responsibility and make a difference (M). *Yes, of course, these are specific drivers [to meet], and after all it [being member of a physician network] is like a commitment to participate in it [QC]… at the same as you may fear limitation in your professional autonomy etc… but there are rules and, if everybody sticks to these rules, it [QC] will work [translated from Swiss German] (3).*
New CMO configuration at the organisational level: **'feeling they have a say'** If an organisation, (e.g. a physician network organisation) has a decentralised policy that encourages the use of local knowledge (C), then the QC takes on tasks (O) because members feel that they have a say in QI in their practice (M). *I was asking myself what autonomy is and what it actually means ... so decentralised organisation means accepting local decisions and having a flexible administration. So not simply stubborn and rigid, but adaptable to local decisions, which are then taken by the QC, for example … [translated from Swiss German] (2).*

So, if I want to promote and do QCs, then it's in the nature of the QC that different groups come up with different solutions. And you have to be able to live with them and you also have to be able to endorse them as an organisation, otherwise the QC instrument wouldn't make sense [translated from Swiss German] (1).

Interviewees largely agreed on the reasons why **GPs feel the need to meet and build groups**, emphasising their need to meet as equals to discuss their everyday professional challenges. They expected administrative help from the physician network organisation, notably to arrange a venue and to provide protected time during which the QC process would not be interrupted. They feared their professional autonomy would be limited if, for instance, physician network organisations interfered in QCs. They also thought that attending QC meetings should not increase their daily workload. All interviewees considered **forming and norming the group** a prerequisite to proper QC function. When participants decided on basic details such as venue, time of day, length of the meeting and the roles participants would take, interviewees felt that this increased the level of trust in the group. They described how participants got to know each other personally and as professionals, creating a safe environment with the help of the skilled facilitator. Enjoyable social activities, such as sharing a meal or a glass of wine, seemed the most appropriate method for this. QC participants should discuss standards for timeliness and agree on these, together with responsibility for duties and rules of communication. If all the participants find their roles and settle in them, mutual acceptance increases and the group creates a safe environment. Interviewees also noted that the facilitator should occasionally remind the group of the agreed-upon norms and invite further discussion of them if they are not being carried out in practice. In line with the literature-based programme theory, interviewees reported that they choose their own facilitator, preferably a GP, and decide on the topics and methods for improving quality in their practice. For these CMO configurations (Table 8.4), the additional data required no changes to be made. I have listed interview quotes as examples in Table 8.9.

Table 8.9 Realist analysis – establishing the group

CMO configuration 3: **'sharing similar needs'** If the administration at the organisational level of QCs provides support (i.e. in training facilitators, data gathering, provision of evidence-based information), and the administration protects time and space and offers CME points and small financial incentives to QC participants (C), then the latter will meet in groups to exchange ideas (O) because GPs prefer learning in QCs (M); support generates positive expectations among participants (M), and GPs think QC meetings with their peers will be useful (M). *Yes, this kind of network allows high organisational and professional autonomy ... and this is a good start for QCs [translated from Swiss German] (2).* *For me, protected time is more than just the aspect of time; it relates to work intensity before and after the meeting ... and not just that the telephone does not ring. I think you should not be disturbed ... and you have to plan that [translated from Swiss German] (3).*
CMO configuration 4: **'need for relatedness'** If a regular group of members engages in socially enjoyable contact, led by a skilled facilitator who, e.g. introduces people to each other, opens discussions, and clarifies and summarises statements (C), then group members will get to know each other and decide on rules that they are willing to follow, building a safe environment based on trust (O) because members want to be among and to interact with equals (M). *I think it is important that we define the basic arrangements, like time, place, etc. and the procedure; that makes us feel safe. And respect and standards must be established and discussed, again and again. If this is done over and over again, there is a possibility to improve everything and give the participants the opportunity to express themselves; I think this is important [translated from Swiss German] (6).* *With a glass of wine … it works best ... The satisfaction in QCs, this concerns my own role, or my emotional situation, because I am basically more satisfied if I have a fulfilling QC with my colleagues [translated from Swiss German] (3).*
CMO configuration 5: **'need for autonomy and control'** If the group chooses its own topics and facilitator (C), then its members will feel they own the QC (O) because their need for autonomy - a feeling of being in control of their own behaviour - is satisfied (M). *So, I think it is important that they are always the same participants and that the place and time frame are clear, and the distribution of tasks. This simply promotes trust in QCs and, on the basis of trust, you can have discussions between one colleague and another. And it is important that the QC can choose both the facilitator and the methods they want to work with [translated from Swiss German] (4b).*
CMO configuration 6: **'size of the group affects communication'** If the group size exceeds 15 (C), then interaction among group participants decreases (O) because participants cannot keep up with each other and follow all conversations (M). *When the group became too big, there were no interactions among participants any more. They all became listeners, and that was the main reason why we decided to split off and start a new QC [translated from Swiss German] (5).*

Disclosures about their own practice require participants to be courageous; all interviewees agreed that they must **feel safe in a learning environment**. They indicated that active involvement in case discussions strengthens participants' professionalism and medical competence. The facilitator encourages all members of the group to share their cases and knowledge. QC members find these case discussions relevant because they can immediately use this knowledge in their practice. Reflection on their own practice starts when participants compare current clinical routines with best practice. For these comparisons, they use their own clinical cases and evidence-based material or data on their own diagnostic and prescription patterns. When participants exchange experiences and explain to each other how and why they took certain clinical decisions, they stimulate discussion about their specific knowledge in specific clinical situations and make implicit knowledge explicit. Interviewees described this process as interactive learning: everyone learns from their peers, viewing their own experiences in the light of evidence-based information or their own data on diagnostic or prescription patterns. According to the interviewees, the facilitator maintains a safe environment in which participants can interact without offending each other. Although it seems difficult to obtain valid data on personal diagnostic or prescription patterns in Swiss QCs, the interviewees confirmed the literature-based CMO configurations as described in this section and expressed the wish that they had easy access to such data. When we discussed the process of how participants can learn from one another, interviewees said that the composition of the group could play a major role in its success or failure. Their experience made clear that a certain amount of diversity in thinking and experience in the group is needed to ensure good group dynamics, but if individuals are too far apart in these areas, then QC work grows difficult. One interviewee said that a skilled facilitator respects different character traits and challenges participants according to their abilities. Interviews also indicated that some individuals do not cope well with critical input from their peers or discussions about their clinical cases. They do not feel comfortable in the group, feel pressured by the exchanges and have difficulty absorbing new

knowledge. Consequently, they can react and disrupt the group in various ways, e.g. through withdrawal or aggressive outbursts.

The interviewees confirmed CMO configurations 7–12 (Table 8.5) and no changes were needed but they added new data on group dynamics at this stage, one at the individual level and one at the group level. I have listed supporting quotes to CMO configurations 7–12 and detailed two new CMO configurations in Table 8.10.

Table 8.10 Realist analysis – learning environment

CMO configuration 7: **'feeling safe and not vulnerable'** If participants trust each other (C), then they can describe how they work and admit what they do not know (O), because they feel safe rather than vulnerable (M). *So, it takes a lot of courage to talk about a [clinical] case, especially if it didn't go really well. And if someone does tell such a story, then he is a role model, and others may have the courage to do the same and they gain trust on the one hand and, on the other hand, a certain feeling of togetherness [translated from Swiss German] (1).*
CMO configuration 8: **'need for competence and self-actualisation'** If the facilitator supports participants and encourages them to tell their stories and share their experiences in a safe environment, e.g. by encouraging interactive responses, through discussions and by summarising statements (C), then participants will become involved and share their positive experiences and failures (O) because they want to improve their professional competence (M), gain professional confidence (M) and fulfil their professional potential (M). *It's about your professionality [as a doctor] and in a case discussion you gain knowledge and learn a lot. Doing that, the doctors are totally focused on their work. (4b). [adds:] that's why I have the feeling that such case discussions are an important basis for the process ... if they are all peers, and everyone has experienced similar situations before, they can empower each other [translated from Swiss German] (4a).*
CMO configuration 9: **'previous knowledge is activated'** If participants exchange case stories and experiences while actively listening to each other in the presence of a skilled facilitator in a safe environment (C), then they will share their knowledge by telling their own relevant stories (O) because the process activates knowledge they already possess (M). *We discuss clinical cases, we show where we made decisions and mistakes ... and then we try to work out the principles, how to go on ... that's an important point, that you can relate difficult situations and the others support you and tell their stories [translated from Swiss German] (6).*
CMO configuration 10: '**immediate relevance for the practice'** If QCs use the technique of experience-based learning (C), then knowledge becomes more relevant to GPs (O) because it relates to their everyday work and they can use it immediately (M).

In the last QC, the topic was euthanasia … and I could use it immediately and was able to apply it. Discussing current cases … I often realise that the problem is actually also about my patients and that the topic helps in my everyday life [translated from Swiss German] (5).

CMO configuration 11: **'cognitive dissonance'**

If participants discuss and reflect on their work processes (e.g. based on trustworthy data or personal experiences) during a professionally facilitated exchange of positive experiences or failures (C), then they discover knowledge gaps and identify learning needs and relevant topics (O) because their own attitudes and behaviours may differ from their peers', creating cognitive dissonance (a negative emotional state triggered by conflicting perceptions) that makes them reconsider their own way of working (M).

Prescription data ... that would be very helpful if I had access to prescription patterns by simple means, or laboratory tests, just go and have a look [translated from Swiss German] (2).

CMO configuration 12: **'social learning'**

If the facilitator uses purposeful didactic techniques (e.g. brainstorming, contentious or consensus discussions, or role-play) to keep the group active and to reward exploratory behaviour during reflection on the work process (C), then the group will create a learning environment that promotes knowledge exchange (O) because learning is a cognitive process in which participants observe and imitate their peers' behaviour to gain social approval (M).

I think it has a lot to do with interactive learning; thanks to the support of evidence-based information, we are all at the same level of knowledge – right? Afterwards, we combine that with case discussions and that takes us further ... an important step ... [translated from Swiss German] (5).

New CMO configuration at the group level: **'variety of characters stimulates reflection – cognitive dissonance'**

If members of the group have individual character traits and describe different professional experiences but accept each other's views (C), then they can learn from each other (O) because individual attitudes and behaviours will contrast with the knowledge of their peers and cause cognitive dissonance that makes them reflect on their way of working (M).

I can't remember if we've talked about this before. But there's one point missing (in the programme theory) and that's the story that the group should have a say about who joins in. If the group is too different and everyone pulls in a completely different direction, it becomes difficult in QCs but it gets difficult as well if differences between participants are too small [translated from Swiss German] (2).

But I think GPs are generally people who want to get together and improve something; so, they are somehow a selection, but a varied selection, otherwise it doesn't work either ... [translated from Swiss German] (5).

Social learning is not without conflict but you have to be able to talk about different views without jumping down each other's throats... and talk about different views ... and that's sometimes a tightrope walk: how hard can I challenge someone – or do I have to treat someone gently? But I also think it depends on the person concerned – if it's someone who's anxious, I'll approach them rather gently as a facilitator [translated from Swiss German] (2).

New CMO configuration at the individual level: **'threat to self-image – strong cognitive dissonance'**

If individuals feel too strong a cognitive dissonance when integrating new knowledge (C), then they may disrupt group dynamics and halt the QC process (O) because their self-image is threatened and they fear the loss of their professional identity (M).

There are exceptions of, of individuals who cannot accept anything in any way and they are self-seeking and cannot learn anything new, who then, even if they participate, are not able to understand anything or to change practice [translated from Swiss German] (4a).

And of course, with time, you trust each other. And you open up, and then I have to find out if people fit in or not; unfortunately, there are a few people who don't fit in. Then decisions have to be made, i.e. they have to leave, if they can't deal with the group or accept something new. Otherwise QCs can't work [translated from Swiss German] (6).

If there is a disrupting feature in it, in the group, that hinders the group from norming, then I have to deal with it. For example, if someone always withdraws, then I have to ask the individual, in front of the group or maybe better in private [translated from Swiss German] (2).

The interviewees largely agreed with the CMO configurations that describe how QC participants **adapt or create and test new knowledge** and they illustrated them with examples. Some degree of pressure from the health insurance companies or the administration at the national level stimulates QCs to devise creative solutions that improve aspects of quality in their practices. One interviewee mentioned that professional associations or primary health care institutions should provide the groups with updated, evidence-based information fitting their topics. Interviewees commented on professional autonomy when we discussed the forming and norming of the group but did not further illustrate CMO configuration 14 ('threat to professional autonomy'). Several interviewees gave examples of the process by which participants exchange personal experiences and compare them to what is generally considered best practice, thereby learning from each other. GPs also compare different data sets (e.g. prescription or diagnostic patterns) with best practice. Interviewees described how this group process leads to new insights, and how skilled facilitation helps participants to create new knowledge, in line with the literature-based programme theory. They emphasised that facilitators address possible barriers to change and spend time looking for ways to remove them. They also thought it was important to test new ideas before implementing them but did not describe this as a step separate from 'social learning'.

Interviewees confirmed CMO configurations 13 and 15–18 (Table 8.6) and illustrated them with examples. They thought statements 14 and 19 were plausible and reasonable but they did not provide any additional data beyond agreement. I have provided supporting quotes from the interview groups to the literature-based CMO configurations in Table 8.11.

Table 8.11 Realist analysis – adapting, creating and testing new knowledge

CMO configuration 13: **'positive interdependence between health insurance companies (or administration at the national level) and GPs'** If physician network organisations require continuous QC activities (C), then QCs will negotiate priorities and design creative solutions (O) because the tension between autonomy and obligation spurs the group to act and negotiate together to reach a common goal (M). *That is certainly a driver to improve quality, and the physician network or the responsible organisation must have the resources to apply these results and at the same time support the QCs, for example with scientific knowledge [translated from Swiss German] (2).*
CMO configuration 14: **'threat to professional autonomy'** If GPs feel that the QC programme is only a top-down managerial intervention to reduce costs (C), then they will not be motivated and will not participate (O) because they feel unsafe and fear they lack autonomy in their clinical role (M). *No data*
CMO configuration 15: **'positive interdependence among group members'** If participants maintain a learning environment based on trust that promotes the exchange of knowledge, assisted by facilitators who use professional techniques (e.g. contentious discussion, reaching consensus and role play) (C), then participants will adapt and generate new knowledge for local use (O) because they see themselves as similar, and so act and negotiate cooperatively to achieve a common goal (M). *The reason why the group drafts such recommendations and continues to work on them is, I really think, so that the group says, 'okay' <u>we</u> need to discuss how to put it together and see if <u>we</u> can use it, and if a facilitator skilfully tackles that and steers the process in a good direction so the group participates, and then the group really does it and creates something new, they get the feeling that we've done it ourselves now [translated from Swiss German] (3).*
CMO configuration 16: **'identifying and removing barriers to change'** If participants, supported by skilled facilitators, address barriers to change (C), then they are more likely to implement the innovation (O) because participants help each other to develop strategies to identify and overcome these barriers (M). *But I don't think barriers are a big problem, because you hardly ever put up relevant barriers if you are there, participating in the QC, and address and solve them during the process [translated from Swiss German] (2*).

CMO configuration 17: **'need for competence, autonomy and relatedness'** If participants create new knowledge and plan an implementation strategy (C), then they feel satisfaction, responsibility and stewardship (O) because this fulfils their need for competence (being able to achieve specific objectives) (M), autonomy (a feeling of being in control of their own behaviour) (M) and relatedness (a sense of connection to a larger group) (M). *And you're satisfied because you were involved, and so you can relate to the content [of the innovation], and that's probably why it works so well; it was well done and I can identify with it ... and support it ... and you feel like you developed it or helped develop it [translated from Swiss German] (4a).*
CMO configuration 18: **'intention to change'** If participants publicly announce their intention to change (C), then they are more likely to implement the change (O) because they and others in the group all think it is a good idea and believe they can carry it through (M). *And that gives me a feeling of significance and satisfaction in QCs, when I've done something like this. And also when I intend to use it [new knowledge] ... the facilitator helps me if he takes me through the PDCA cycle. In this phase, the facilitator is very important, important for planning, because he helps me when I have to plan; that is, when the members or at least one of them has decided to change behaviour [translated from Swiss German] (2).*
CMO configuration 19: **'testing new knowledge'** If participants validate and test new knowledge in a QC, moderated by a skilled facilitator in a safe environment (C), then they feel confident putting that knowledge to use in everyday practice (O) because they have had the opportunity to practise and familiarise themselves with the innovation (M). *No data*

Interviews confirmed that QC participants gain confidence in an innovation through repeated use. The more the participants use QC techniques, the better they implement new knowledge: **an iterative process is crucial** to implementing new knowledge and making skilled use of QC techniques. Based on the interview data, I have left CMO configurations 20 and 21 unchanged (Table 8.7) and added illustrative examples of quotes from the interviews and focus groups in Table 8.12.

Table 8.12 Realist analysis – repeating the process

CMO configuration 20: **'gaining confidence in an innovation'** If the group repeatedly practises implementing and adjusting to an innovation (C), then its members trust their own competence and turn the innovation into a habit (O) because successful outcomes increase their confidence in their abilities (M).

But to recognise whether the process actually leads to a change in my own behaviour, I have to have an outside indicator that shows it to me, time and again. In principle, this means that I have to have an external objective assessment of what I am doing and whether anything is changing – and this helps to change my behaviour and to gain confidence in the innovation [translated from Swiss German] (1).
CMO configuration 21: **'repetition priming and automaticity'** If participants build a regular group and practice using QI tools (C), then they will successfully implement new knowledge into everyday practice (O) because responses improve with repetition: 'practice makes perfect' (M). *It is a fact that you use the same techniques over and over again, in terms of methodology – and don't even notice it ... so, even if you don't notice it, it helps to improve quality in PHC, that's for sure, that's absolutely right [translated from Swiss German](3).*

I held **two focus groups** at the EQuiP Conference in Fischingen 2015, as described in Chapter Four, Phase III. As so many people wanted to participate, I included 21 participants in the first group, instead of the 12 for whom I had planned, with 12 participants forming a second group. At each focus group, I shared statements derived from my CMO configurations with all the participants and, for each statement, JH asked the group whether they generally agreed with it or not. She also asked the reasons for their response and led a discussion about the issues. I noted the number of agreements and disagreements for each statement and recorded participants' rationales. The majority of participants agreed; even in the large group, very few people were unsure or disagreed. As I listened, I took notes of participants' statements about possible mechanisms. I have summarised the agreements, disagreements and suggested mechanisms in Appendix 8.4. When participants discussed the statements, most disagreements vanished.

Participants in both focus groups had strong opinions about the facilitator's role and profession. Nearly all the participants agreed that GPs should facilitate the process as one among equals. They thought it made QCs more credible to GPs if they were facilitated by a GP specially trained in facilitating QCs. Two participants favoured the idea that facilitators should have a *leading* role during the QI process and that they should receive training in leadership skills. Focus group participants pointed out that various barriers at the organisational level may hinder their full, effective and equal participation in QCs. These barriers included difficulties in securing a suitable

venue or protected time, or excessive demands from management focussed on cost savings instead of clinical need. Focus-group members also mentioned that QCs work most effectively if members have the autonomy to select the tasks and the problem-solving methods. They also mentioned that an adequate level of expectation from their organisation may be an important driver in maintaining the process and agreed that QCs succeed where the management agrees on shared decisions regarding the use of new knowledge and accepts a certain a degree of diversity within the organisation.

Based on the notes I took during the focus groups, members of the focus groups agreed with and cited the same mechanisms as those I had identified in the literature and interviews. I found no additional CMO configurations relevant for the QC programme theory.

Update of the search

The search update included papers published until the end of December 2017 and identified eight further papers relevant to the QC programme. I used the same methods to identify kinship papers and found a further six articles. GW checked the process of identifying and selecting the papers and the data extraction process. I found no new data describing the mechanisms underlying QCs and my interpretation of the data was that there were no new CMO configurations relevant to the existing QC programme. The characteristics of these studies are listed in Table 8.2. I installed automatic alerts for the searches in Ovid Embase and MEDLINE and I follow the results regularly. A short inspection of the literature from January 2018 to December 2019 yielded no new findings.

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Chapter Nine: Results of Phase IV: consolidation of the programme theory using additional interviews with stakeholders across Europe

In Chapter Nine, I present the results of additional interviews I conducted with selected stakeholders from European countries with different health systems to consolidate the QC programme theory. I focussed on the different contextual layers of the programme theory and, specifically, on the official bodies at national level, e.g. the Federal Office of Public Health, and organisational or institutional level, e.g. professional associations.

The interviews confirmed and consolidated the programme theory and provided many illustrative examples. Interview data about the organisational level led me to add a further CMO configuration. The interviews suggested that QCs can only succeed if they are embedded in a wider system that helps participants to negotiate and sign contracts with governmental bodies or health insurance companies, organises training and supervises facilitators, offers courses on QI in PHC, and facilitates access to educational material and timely data on practice performance. The consolidated programme theory on QCs, based on all the data from the realist review, interviews and focus groups and additional interviews, is summarised in Table 9.1.

Table 9.1 Consolidated programme theory on quality circle

I. **Preconditions**

a) 'Need for autonomy and obligation'

If the administration at national level, or at the level of health insurance companies, entrusts GPs with QI and autonomy (so they can decide how to implement it) (C), then GPs might participate in QCs (O) because they feel they can take on the responsibility and make a difference (M).

b) New CMO configuration: 'Being embedded in a QI system'

If QCs are embedded in a QI system (an organisation that negotiates and signs contracts with governmental bodies or health insurance companies, trains and supervises facilitators, provides courses on QI in PHC, and easily accessed educational material, timely data on practice performance and protected time and space) (C), then participants will take on responsibility and work in a purposeful way (O) because they feel supported, empowered and capable of meeting expectations (M).

c) 'Feeling they have a say'

If an organisation (e.g. a physician network organisation) has a decentralised policy that encourages use of local knowledge (C), then the QC takes on tasks (O) because members feel that they have a say in QI in their practice (M).

d) 'Participants know what to expect'

If the introductory workshop teaches the principles of QI in PHC and illustrates how QCs work (C), then potential members may be more willing to join QCs (O) because they know what to expect and feel that they can meet expectations (M).

II. **Establishing the group**

a) 'Sharing similar needs'

If the administration at the organisational level of QCs provides support (i.e. in training facilitators, data gathering, provision of evidence-based information), and the administration protects time and space and offers CME points and small financial incentives to QC participants (C), then the latter will meet in groups to exchange ideas (O) because GPs prefer learning in QCs (M); support generates positive expectations among participants (M) and GPs believe that QC meetings with their peers will be useful (M).

b) 'Need for relatedness'

If a regular group of members engages in socially enjoyable contact, led by a skilled facilitator who, e.g. introduces people to each other, opens discussions and clarifies and summarises statements (C), then group members will get to know each other and decide on rules that they are willing to follow, building a safe environment based on trust (O) because members want to be among and to interact with equals (M).

c) 'Need for autonomy and control'

If the group chooses its own topics and facilitator (C), then its members will feel they own the QC (O) because their need for autonomy - a feeling of being in control of their own behaviour - is satisfied (M).

d) 'Size of the group affects communication'

If the group size exceeds 15 (C), then interaction among group participants decreases (O) because participants cannot keep up with each other and follow all conversations (M).

e) ‘Variety of characters stimulates reflection – cognitive dissonance’

If members of the group have individual character traits and describe different professional experiences but accept each other’s views (C), then they can learn from each other (O) because individual attitudes and behaviours will contrast with the knowledge of their peers and cause cognitive dissonance (a negative emotional state triggered by conflicting perceptions) that makes them reflect on their way of working (M).

f) ‘strong cognitive dissonance threatens self-image’

If individuals feel too strong a cognitive dissonance when integrating new knowledge (C), then they may disrupt group dynamics and halt the QC process (O) because their self-image is threatened and they fear losing their professional identity (M).

III. Learning environment

a) ‘Feeling safe and not vulnerable’

If participants trust each other (C), then they can describe how they work and admit what they do not know (O), because they feel safe rather than vulnerable (M).

b) ‘Need for competence and self-actualisation’

If the facilitator supports participants and encourages them to tell their stories and share their experiences in a safe environment, e.g. by encouraging interactive responses, through discussions and by summarising statements, (C) then participants will become involved and share their positive experiences and failures (O) because they want to improve their professional competence (M), gain professional confidence (M) and fulfil their professional potential (M).

c) ‘Previous knowledge is activated’

If participants exchange case stories and experiences while actively listening to each other in the presence of a skilled facilitator in a safe environment (C), then they will share their knowledge by telling their own relevant stories (O) because the process activates knowledge they already possess (M).

d) ‘Immediate relevance for the practice’

If QCs use the technique of experience-based learning (C), then knowledge becomes more relevant to GPs (O) because it relates to their everyday work and they can use it immediately (M).

e) ‘Cognitive dissonance’

If participants discuss and reflect on their work processes (e.g. based on trustworthy data or personal experiences) during a professionally facilitated exchange of positive experiences or failures (C), then they discover knowledge gaps and identify learning needs and relevant topics (O) because their own attitudes and behaviours may differ from their peers’, creating cognitive dissonance that makes them reconsider their own way of working (M).

f) ‘Social learning’

If the facilitator uses purposeful didactic techniques (e.g. brainstorming, contentious or consensus discussions, or role play) to keep the group active and to reward exploratory behaviour during reflection on the work process (C), then the group will create a learning environment that promotes knowledge exchange (O) because learning is a cognitive process in which participants observe and imitate their peers’ behaviour to gain social approval (M).

IV. **Adapting, creating, and testing new knowledge**

a) 'Positive interdependence between the administration at the national level and GPs'

If the administration at national level requires continuous QC activities (C), then QCs will negotiate priorities and design creative solutions (O) because the tension between autonomy and obligation spurs the group to act and negotiate together to reach a common goal (M).

b) 'Threat to professional autonomy'

If GPs feel that the QC programme is only a top-down managerial intervention to reduce costs (C), then they will not be motivated and will not participate (O) because they feel unsafe and fear they lack autonomy in their clinical role (M).

c) 'Positive interdependence among group members'

If participants maintain a learning environment based on trust that promotes the exchange of knowledge, assisted by facilitators who use professional techniques (e.g. contentious discussion, reaching consensus and role play) (C), then participants will adapt and generate new knowledge for local use (O) because they see themselves as similar, and so act and negotiate cooperatively to achieve a common goal (M).

d) 'Identifying and removing barriers to change'

If participants, supported by skilled facilitators, address barriers to change (C), then they are more likely to implement the innovation (O) because participants help each other to develop strategies to identify and overcome these barriers (M).

e) 'Need for competence, autonomy and relatedness'

If participants create new knowledge and plan an implementation strategy (C), then they feel satisfaction, responsibility and stewardship (O) because this fulfils their need for competence (being able to achieve specific objectives) (M), autonomy (a feeling of being in control of their own behaviour) (M) and relatedness (a sense of connection to a larger group) (M).

f) 'Intention to change'

If participants publicly announce their intention to change (C), then they are more likely to implement the change (O) because they and others in the group all think it is a good idea and believe they can carry it through (M).

g) 'Testing new knowledge'

If participants validate and test new knowledge in a QC, moderated by a skilled facilitator in a safe environment (C), then they feel confident putting that knowledge to use in everyday practice (O) because they have had the opportunity to practise and familiarise themselves with the innovation (M).

V. **Repeating the process**

a) 'Gaining confidence in an innovation'

If the group repeatedly practises implementing and adjusting to an innovation (C), then its members trust their own competence and turn the innovation into a habit (O) because successful outcomes increase their confidence in their abilities (M).

b) 'Repetition priming and automaticity' - 'practice makes perfect'

If participants build a regular group and practise using QI tools (C), then they will successfully implement new knowledge into everyday practice (O) because responses improve with repetition (M).

I used the interviews with participants from different European countries to consolidate the revised programme theory presented in Table 8.1 and explore its contextual layers: the level of official bodies, e.g. the Federal Office of Public Health; the organisational level, e. g. national professional associations and administrative organisations that organise and support QCs; the contextual layer of the group, i.e. the level of interpersonal relationships and, finally, the individual level. I focussed closely on the organisational level because literature on it was scarce. I checked each CMO for its configuration, interpretation, underlying mechanism and time-relation to others. Interviews were conducted in English but, with the exception of the participant from Ireland, all interviewees were non-native English-speakers who sometimes found it difficult to express their thoughts and switched to their native language or German. Since I am a native Swiss German-speaker and fluent in Scandinavian languages and French, this did not affect the course of the interviews. To keep the transcript in one language, I translated these short passages into English. See Appendix 9.1 for all the sources and the quotes for each CMO configuration.

The interviewees provided rich data and detailed descriptions about what they deemed **necessary preconditions** for successful QCs. They observed that the government or administration at national level should entrust GPs with QI to create a sense of responsibility for this task. According to my participants, trusting GPs gives them the power to decide what they discuss and how they run QCs, but there should be a complementary obligation to implement QI activities in their own daily practice, a statement that confirms CMO configuration I a). The interviewees emphasised that QC should be embedded in a system of continuous QI that empowers GPs in their tasks. Organisations, colleges or professional bodies that may take on responsibility for supporting GPs should negotiate and sign contracts that have reasonable terms with governmental bodies or health insurance companies. They should also arrange training and supervision for facilitators, organise courses about QI in PHC and provide easily accessed educational material and timely data on individual performance such as data on drug prescriptions or test ordering. This should allow GPs to increase their own competence and to develop their skills in QI. Organisations should also provide GPs with

protected time off from clinical work so they are paid for planning, participating in and analysing the results of their QI efforts. Based on the additional interview data, I built a new CMO configuration. The interviewees thought that statement I b) was plausible but provided no additional data beyond agreement. They did give examples indicating that GPs need to know what QI is and how QCs function so they can meet the expectations of governmental or organisational institutions. Based on the interview data, I also left the remaining CMO configurations, I a) and c), unchanged. Table 9.2 provides illustrative quotes from the additional interviews.

Table 9.2 Realist analysis - preconditions for QCs

I. <u>Preconditions</u>
a) 'Need for autonomy and obligation' If the administration at national level or at the level of health insurance companies entrusts GPs with QI and autonomy (so they can decide how to implement it) (C), then GPs might participate in QCs (O) because they feel they can take on the responsibility and make a difference (M). *So, we got more money, but it was for the government no value for money … well … extra value for the money. The only obligation was to participate in the local QC which had to gather four times a year, and you had to participate at … at least two of them every year to keep your accreditation. But you should have an obligation to improve your quality in your practice (1).*
<u>New</u> CMO configuration: 'Being embedded in a system of QI' If QCs are embedded in a QI system (an organisation that negotiates and signs contracts with governmental bodies or health insurance companies, trains and supervises facilitators, provides courses on QI in PHC, and easily accessed educational material, timely data on practice performance and protected time and space) (C), then participants will take on responsibility and work in a purposeful way (O) because they feel supported, empowered, and capable of meeting expectations (M). *… embedding QCs in a system … organising during working time is one ... training facilitators is another one, in a continuous way and honouring in one way or another, maybe financially, especially for the extra hours and the extra work they put into it, and ... offering GPs the possibility of easily gathering data about their own practice ... in a much shorter time, getting feedback on your practice from a national level and getting it in a systematic way ... brought into the peer review would be a good way (1).* *…so, you know the evaluation is mainly to help the person who is organising; the evaluation is really for the tutor, because they [the organisation] are structuring and organising the meetings and it is really seen as a support process … (2).*

I think our problem is at the level of the organisational context. We don't get any support, we don't have protected time, we don't get any help to ... implement new things and do quality improvement … administrative support does not exist …and we have too much to do … too many patients a day (5).
b) 'Feeling they have a say' If an organisation, (e.g. a physician network organisation) has a decentralised *policy that* encourages use of local knowledge (C), then the QC takes on tasks (O) because members feel that they have a say in QI in their practice (M). *No additional data.*
c) 'Participants know what to expect' If the introductory workshop teaches the principles of QI in PHC and illustrates how QCs work (C), then potential members may be more willing to join QCs (O) because they know what to expect and feel that they can meet expectations (M). *so ... some of them will work well [depending on] whether there is somebody who is inspired and wants to take the lead and knows something about peer review, but most of them are just nice meetings to see colleagues and ... have somebody give a presentation or have some food and drink. So, you should really teach them first! (1).* *…because they are paid for it and but ... there has not been enough understanding in the medical corps to ... to do it and it usually comes on top of all the other ... (3).*

Establishing a group is a prerequisite for successful QC work. Interviewees observed that GPs appreciate exchanges with peers and that this may be the key mechanism for building groups (CMO configuration II a). Informal exchanges, when eating and drinking a glass of wine together, promote social bonding and provide the opportunity for participants to decide on rules for their group. The group turns into a forum where GPs can openly exchange thoughts about their everyday concerns, which helps them to cope with their experiences and develop professionally and fosters a sense of community (CMO configuration IIb). Interviewees asserted that if the group can collaborate with its peers to identify and choose their own topics, they will feel that they are in charge (CMO configuration II c). They provided examples of the importance of the group's size and composition, for reasons described in CMO configurations II d) and e). Interviewees described individuals who find it hard to fit into a group that asks them to reflect on their own performance, and examples of QC participants who had beliefs or ideas that diverged from the group's and could

not resolve this contradiction constructively, e.g. by reflecting on and discussing different perspectives (CMO configuration II f)). Since the interview data aligned with the results displayed in Table 8.1, I did not change the CMO configurations and only added supporting quotes from the additional interviews (Table 9.3).

Table 9.3 Realist analysis - establishing the group

II. Establishing the group
a) 'Sharing similar needs' If the administration at the organisational level of QCs provides support (i.e. in training facilitators, data gathering, provision of evidence-based information), protects time and space and offers CME points and small financial incentives to QC participants (C), then the latter will meet in groups to exchange ideas (O) because GPs prefer learning in QCs (M); support generates positive expectations among participants (M) and GPs believe that QC meetings with their peers will be useful (M). *And I think that ... the other thing that is important to the group is the CME / CPD points that they get and the funding from the government to attend meetings. That is all supporting the meetings as well (2).*
b) 'Need for relatedness' If a steady group of members engages in socially enjoyable contact, led by a skilled facilitator who, e.g. introduces people to each other, opens discussions, and clarifies and summarises statements (C), then group members will get to know each other and decide on rules that they are willing to follow, building a safe environment based on trust (O) because members want to be among and to interact with equals (M). *…and we do that at dinner time so we can have some food together; we work, have dinner and we can enjoy food at the same time (4).* *… but it became clear that we started to get to know each other and each other's sensibilities and to dare to tell about how we handle things and we learnt how to handle each other in a respectful way. Now we have to see how it continues (1).*
c) 'Need for autonomy and control' If the group chooses its own topics and facilitator (C), then its members will feel they own the QC (O) because their need for autonomy - a feeling of being in control of their own behaviour - is satisfied (M). *…exactly big autonomy, the groups decide, there is no pressure from the political system and there is no pressure from anybody and that is why this system is so successful – the doctors can choose (2).*

d) ‘Size of the group affects communication’

If group size exceeds 15 (C), then interaction among group participants decreases (O) because participants cannot keep up with each other and follow all conversations (M).

For instance, if … I think …15 people is too many … I think eight is enough and ... the stress increases if there are more … the smaller the group is, the better the trust and talking (4).

e) ‘Variety of characters stimulates reflection – cognitive dissonance’

If members of the group have individual character traits and describe different professional experiences but accept each other’s views (C), then they can learn from each other (O) because individual attitudes and behaviours will contrast with the knowledge of their peers and cause cognitive dissonance (a negative emotional state triggered by conflicting perceptions) that makes them reflect on their way of working (M).

…. because you can learn from [other] people with more experience, … you have a [another] way of thinking and [another] way of talking about stuff, situations, that are different I think, so I think it is about different knowledge (4).

f) ‘strong cognitive dissonance threatens self-image’

If individuals feel too strong a cognitive dissonance when integrating new knowledge (C), then they may disrupt group dynamics and halt the QC process (O) because their self-image is threatened and they fear losing their professional identity (M).

Yes, we do, yeah, we have doctors who are ... difficult in the group, yes, and they are difficult because they have very firm views and they spend very little evidence on reality. Then it is very important that you have good group leaders and leadership … It is very few … you know trying to sabotage the group … and they don’t tend to change behaviour (2).

The next step for successful QCs is to create **a learning environment** in which GPs can learn from each other in a safe environment. Interviewees agreed and confirmed that GPs need a safe environment built on trust if they are to disclose how they work in everyday practice (CMO configuration III a). They said that it is good for their professional development to share and discuss with the group their feelings of distress, uncertainty and possible weaknesses and also their strengths, in relation to specific clinical problems and all the other difficulties a GP may encounter (CMO configuration III b). When GPs start talking about their experiences, they stimulate each other to tell their stories and contribute their knowledge about specific clinical situations (CMO configuration III c). As the discussions are primarily about everyday work, the GPs feel that they are relevant and of immediate use (CMO configuration III d). Moreover, when the facilitator uses

interactive, case-based, experiential and dialogical didactic techniques, GPs become very engaged and learn from each other. Knowledge depends on perspectives, so each member of the group can contribute, and they hear a range of different views that ideally encompass everything from the micro view of single-patient care to the macro view of how the system works (CMO configurations III e and f). Based on the interview data, I left the CMO configurations unchanged and added supporting quotes in Table 9.4 from the additional interviews.

Table 9.4 Realist analysis - learning environment

III. Learning environment
a) 'Feeling safe and not vulnerable' If participants trust each other (C), then they can describe how they work and admit what they do not know (O), because they feel safe rather than vulnerable (M). *...she told me, you know, one of the things I learnt from you, one of the things I experienced from you is that … opening up with difficult cases and showing that you don't know everything, is showing that you are vulnerable and not knowing what do with it …you build up trust because if you dare to do this, it gives us the confidence that we also can do that … (1)* *We know each other very well, so I don't think anybody gets angry about this… and nobody ... gets emotionally the wrong way… if you understand what I mean (5).*
b) 'Need for competence and self-actualisation' If the facilitator supports participants and encourages them to tell their stories and share their experiences in a safe environment, e.g. by encouraging interactive responses, through discussions and by summarising statements (C), then participants will be involved and share their positive experiences and failures (O) because they want to improve their professional competence (M), gain professional confidence (M) and fulfil their professional potential (M). *… and the fact that you can explain it to the others makes you realise that ... you have a bit anxiety about it and all the others tell you that this ok – not just because they want to comfort you … then you realise that you became nervous about something very quickly … even if you did something good after all… the group at this moment is very … a peaceful place and a good way of being with yourself and your own way of practising and it increases your self-esteem as well (4).* *But sometimes it is about our problems ... our professional life … about our patient, about some case … diagnostics or prescriptions (5).*
c) 'Previous knowledge is activated' If participants exchange case stories and experiences while actively listening to each other in the presence of a skilled facilitator in a safe environment (C), then they will share their knowledge by telling their own relevant stories (O) because the process activates knowledge they already possess (M).

It does satisfy us when we can discuss our own work and our own cases, and we feel closer in the group when we stimulate each other's thinking (4).

d) 'Immediate relevance for the practice'

If QCs use the technique of experience-based learning (C), then knowledge becomes more relevant to GPs (O) because it relates to their everyday work and they can use it immediately (M).

... a lot of the doctors will start with a clinical case, but then come to an overview and then discussions and the next step is organising the GP surgery for that – it is quick wins (3).

e) 'Cognitive dissonance'

If participants discuss and reflect on their work processes (e.g. based on trustworthy data or personal experiences) during a professionally facilitated exchange of positive experiences or failures (C), then they discover knowledge gaps and identify learning needs and relevant topics (O) because their own attitudes and behaviours may differ from their peers', creating cognitive dissonance that makes them reconsider their own way of working (M).

When for example a GP ... in a gr ... group is saying that he does a particular thing that is purely not right, not evidence-based or in fact is wrong, then the group are very good ... I think because they know each other... they do not agree with the doctor but they actually discuss it in the group and a few other doctors say what they would do which is usually different and they usually say ' you may consider this as a different way of doing it because if you do it your way, this is what I find happens...' and there is never an issue where somebody needs to feel bad, but they know that whatever they are currently doing is not what the others would (2).

f) 'Social learning'

If the facilitator uses purposeful didactic techniques (e.g. brainstorming, contentious or consensus discussions, or role play) to keep the group active and to reward exploratory behaviour during reflection on the work process (C), then the group will create a learning environment that promotes the exchange of knowledge (O) because learning is a cognitive process in which participants observe and imitate their peers' behaviour to gain social approval (M).

So, I think that the more experienced GPs bring in their cases into the groups and they discuss their experiences within the groups and I think this is very powerful for the group and the younger GPs bring in ... they have the latest evidence in their head and the guidelines and they bring it in .., and the mix of managing the patient with the evidence and the guidelines and the practical bit from the older GP who has the experience, I think this is really the powerful bit in the group and ... and this is where the learning really occurs (2).

Yes, ... in the beginning we thought this (sharing data) had to be in pairs or triplets because we thought that people were not willing to share, but that was quite wrong. They love to share! (3).

Interview data indicate that GPs take on the responsibility for QI if national organisations or health insurance companies assign them this task (CMO configuration I a). It seems, however, equally important that the institutions make clear that they have the same goals as the GPs – an affordable

PHC that functions well – so that GPs take responsibility and **adapt or create and test new knowledge** to improve everyday practice (CMO configuration IV b). GPs must feel professionally autonomous if they are to feel accountable for QI, although the health insurance companies or national organisations may voice certain expectations (CMO configuration VI c). GPs generate new concepts and ideas when the group reflects on its own experience and discusses individual cases. Its members add information from other sources to illustrate their practice and then compare the current status of their practice with contemporary, evidence-based, educational material. During this process, facilitators try to reach a balance between comfort and an appropriate degree of tension and challenge as group members try to reach their common goal; group members feel that they all are in the same boat (CMO configuration IV c). The group must discuss the advantages and disadvantages of new ideas or ways of working because when the members attempt to implement them, they need to address the barriers identified during discussions (CMO configuration IV d). Those I interviewed acknowledged and confirmed statement IV e) but did not give me examples that illustrated it. They did give examples of CMO configuration IV f), describing how group participants formulate possible improvements based on their own practice and decide on an action plan. After testing and playing with new knowledge, group members integrate it and then begin implementing it (CMO configuration IV g). As the interview data confirmed all the statements, the CMO configurations remain unchanged; I have included supporting quotes from the additional interviews in Table 9.5.

Table 9.5 Realist analysis - adapting, creating and testing new knowledge

IV. Adapting, creating and testing new knowledge
a) 'Positive interdependence between the administration at the national level and GPs'
If the administration at national level requires continuous QC activities (C), then QCs will negotiate priorities and design creative solutions (O) because the tension between autonomy and obligation spurs the group to act and negotiate together to reach a common goal (M).
It may be important for the emerging of QCs, that it becomes a mandatory thing [QI] and, after all, we have the same goals [as the health insurance companies] (4).

b) ‘Threat to professional autonomy’

If GPs feel that the QC programme is only a top-down managerial intervention to reduce costs (C), then they will not be motivated and will not participate (O) because they feel unsafe and fear they lack autonomy in their clinical role (M).

…no there are no demands, … that wouldn’t help, there can be wishes, but we decide how we do it… it wouldn’t work otherwise (3).

c) ‘Positive interdependence among group members’

If participants maintain a learning environment based on trust that promotes the exchange of knowledge, assisted by facilitators who use professional techniques (e.g. contentious discussion, reaching consensus, and role play) (C), then participants will adapt and generate new knowledge for local use (O) because they see themselves as similar, and so act and negotiate cooperatively to achieve a common goal (M).

I think that a group … cannot just be presented with things like, ‘here is the evidence, take it or leave it and goodbye’ and I don’t think that works. I think that people need to ... participate in the learning and they have to show what they are currently doing, whether it is the correct thing or not; it needs to be discussed and adjusted and shared within the group (2).

d) ‘Identifying and removing barriers to change’

If participants, supported by skilled facilitators, address barriers to change (C), then they are more likely to implement the innovation (O), because participants help each other to develop strategies to identify and overcome these barriers (M).

And I think you have to have guidelines that are workable for doctors who are, you know, seeing 30 to 40 people every day and, if they want to implement change for the better, they have to be feasible and practical and I think the only way to do that is to consider what they are currently doing. And what the barriers are to new care (2).

e) ‘Need for competence, autonomy and relatedness’

If participants create new knowledge and plan an implementation strategy (C), then they feel satisfaction, responsibility and stewardship (O) because this fulfils their need for competence (being able to achieve specific objectives) (M), autonomy (a feeling of being in control of their own behaviour) (M) and relatedness (a sense of connection to a larger group) (M).

No data

f) ‘Intention to change’

If participants publicly announce that they intend to change (C), then they are more likely to implement the change (O) because they and others in the group all think it is a good idea and believe they can carry it through (M).

… and I think that is the opportunity to state it [intention to change] … not everybody participates in that … but … most people do … and they’d say look this is what I learned, this is new for me, this is what I am … going to change in my practice (2).

g) ‘Testing new knowledge’

If participants validate and test new knowledge in a QC, moderated by a skilled facilitator, in a safe environment (C), then they feel confident putting that knowledge to use in everyday practice (O) because they have had the opportunity to practise and familiarise themselves with the innovation (M).

… and I think that the idea of a quality circle meeting trying make changes dramatically is not practical. I think doctors need to look at ideas and look at the practical parts to see what they can do and change slowly over time (2).

The interviewees agreed that the group has to repeat the process to successfully implement innovations. Participants in QCs do not usually succeed in putting innovations into practice straight away, but realise that each attempt brings them closer to success (CMO configuration V a). At the same time, participants grow more skilled in QC techniques (CMO configuration V b). As the interview data confirmed all the statements, I did not change them, but added supporting quotes (Table 9.6) from the additional interviews.

Table 9.6 Realist analysis - repeating the process

V. <u>Repeating the process</u>

a) ‘Gaining confidence in an innovation’

If the group repeatedly practises implementing and adjusting to an innovation (C), then they trust their own competence and turn the innovation into a habit (O) because successful outcomes increase their confidence in their abilities (M).

… then we meet again after four months and usually the … their quality improvement project … didn’t really happen or just a little bit, and we discuss the reasons for that and how we could amend that, etc. etc. (3).

b) ‘Repetition priming and automaticity’

If participants build a regular group and practise using QI tools (C), then they will successfully implement new knowledge into everyday practice (O) because responses improve with repetition: ‘practice makes perfect’ (M).

… but the QC is really a double thing. It is about a theme but it is also about quality improvement. And the aim and goal is that they find it so rewarding that they use this this technique again and again … in their own surgeries and in their own groups (3).

Chapter Ten: Discussion and conclusions

Chapter Ten offers an overview of the programme theory on QCs and how it relates to the existing theories I used to explain specific CMO configurations. Some CMO configurations fit well with, or are directly supported by, existing theories; others seem to clarify how the existing theories work when applied to QCs. The self-determination theory describes the basic needs of individuals (competence, relatedness and autonomy) that compel them to participate in QCs. Theories about the organisational setting elucidate the mechanisms by which organisations help or hinder QCs in their work. The PARiHS framework (Promoting Action on Research Implementation in Health Services) illustrates how GPs' perceptions of knowledge and the quality of the context, and facilitation, influence the outcome of QCs. Theories about groups and facilitation show how groups form and norm their rules, and that this is a prerequisite for building an environment of trust in which participants can exchange ideas and thoughts. Social learning theory frames learning as an active cognitive process of perception and thinking in a social context such as QCs. This active process increases the likelihood that the QC will produce insights and new assessments that expand the knowledge of participants. Adult-learning theories suggest that adults are highly motivated; they learn things that are immediately useful to them, and prefer to do so in a self-directed, task-oriented, experience-based manner. Social interdependence theory explains why groups may work together towards a common goal. When QC participants realise that they will only achieve their own goals if their peers achieve theirs, it creates a positive interdependence, which encourages participants to reassure and support each other in pursuit of those goals. Cognitive dissonance describes a negative emotional state triggered by conflicting perceptions. Generally, people want to reduce discordant feelings and, in the safe environment of a QC, cognitive dissonance prompts GPs to reflect on and accept new arguments or revise their old ones to resolve the internal conflict. Knowledge-creation theories describe the process by which implicit knowledge becomes explicit in QCs as participants relate and combine their experiences with other explicit knowledge such as evidence-based information, generating new concepts that participants

integrate into their everyday clinical practice. The theory of planned behaviour describes how intentions can change behaviour if the new behaviour makes sense, if others approve of the behaviour and if it is easy enough to change. When participants feel that they belong to the group, are satisfied with the process and believe they are learning, they feel a sense of psychological ownership. Finally, there are theories that support the argument that QCs are much more successful when they repeatedly implement new knowledge, giving participants the opportunity to build confidence in the innovation and their QC skills.

Based on the programme theory on QCs, I can make recommendations for policy-makers, tutors, facilitators and participants about how to start QCs or how to modify and improve existing initiatives. Governmental bodies should entrust GPs with QI. To function effectively and contribute to local QI, I recommend providing basic administrative and professional support to QCs. New QC members should be trained in the principles and practices of QI, which should provide them with the knowledge and skills to use QC techniques. QC organisers should create supportive contextual preconditions, such as giving QC members access to appropriate venues, protected time, easily accessed educational material or access to local and national data; these will motivate GPs to participate. Professional organisations should train facilitators because the success of QCs depends on facilitators who can help potential QC members and steer the QI process. The social dimensions of the group are also important to its effectiveness; participants should feel comfortable exchanging knowledge in frank discussions rooted in mutual trust. To maintain a sense of ownership, QC groups need local autonomy to choose the topics or clinical areas they want to address. To remain focussed, they should agree on a topic and decide how to address it before they start the QI cycle. Decisions about what to change must take into account both local expertise and broad knowledge so that participants can amalgamate experience-based and evidence-based knowledge in their innovations. Implementing innovations into practice is a continuous and repetitive process.

In the section outputs and dissemination strategy, I will show how the collaborative, participatory research approach became part of my dissemination strategy. My colleagues, facilitators, tutors and managers spread knowledge about my research in Switzerland and many other European countries. I founded the EQuiP working group on QCs in 2015 at an international meeting in Switzerland to build networks between countries with similarly structured health-care systems and to develop teaching material for training based on the programme theory. In 2016, I founded the Swiss Forum for Quality Circles, including representatives from 11 professional associations who use QC for CME/CPD and QI. We implemented my recommendations on QCs in our joint basic training and practise them at yearly national meetings for facilitators. During my studies, I was able to publish a scoping review in 2018 that covered the definition, conduct and spread of QCs. In 2019, I published a survey about the core characteristics and significance of QCs in European countries.

In this chapter, I will also briefly explore possible future research. Although I developed the programme theory on QCs rigorously, it will benefit from additional testing – it relies on the detail and depth of the reports I identified in the literature review, on the quality of the data I collected in my interviews and on my choice of underlying theories and their synthesis. I cover the details in the section about the strengths and limitations of my research. Future tests of the programme theory in real-world conditions may, therefore, refine or revise the CMO configurations of the programme theory.

I conclude this chapter with personal reflections on this long journey and how this research changed my thinking and attitudes towards my clinical work and teaching. My work is now more rewarding because learning to think like an academic has made me more reflective about what I am doing and the different roles I play in various situations, be it as a GP, teacher or researcher.

Summary of the programme theory

After a stepwise synthesis of published literature and sequential interviews that critiqued and consolidated the programme theory on QCs, I can now explain my principal findings:

Participants in QCs need to feel that they have a say in their CPD and QI work. This feeling of autonomy should be linked to a belief they are obliged to take on these tasks. Participants should have the opportunity to learn about QI and prepare themselves for their work in QCs. QCs should be embedded in a system where professional institutions provide groups with evidence-based information, train and supervise facilitators and offer CME credits to recognise QI work. Organisations that provide PHC should give members easily accessed educational material and data drawn from trustworthy sources to reflect their practice. They should respect GPs' professional autonomy and should not interfere in GPs' daily work with patients or their organisational autonomy. GPs should be able to choose the topics discussed and decide how to approach them. Administrative support includes booking appropriate venues and protecting GP time so that, for example, other professionals take on their immediate tasks during QCs. A decentralised organisation should grant GPs the freedom to develop local solutions and innovatively address their chosen topics.

QC members and their group dynamics are at the heart of the QC process. Social bonding usually starts with socially enjoyable activities such as sharing a meal. Careful facilitation encourages group members to get to know and trust each other. GPs prefer to learn in peer groups and like to exchange personal thoughts and experiences. Variety in the group is the source of lively discussions and creativity but group size affects communication; the optimum number of QC participants seems to be between five and twelve participants.

This non-hierarchical group creates a climate of trust that promotes a culture of free speech in which GPs discuss everyday problems with their peers. When GPs think and talk about a clinical

situation, they extend it to other similar cases, expanding their professional expertise and growing more confident in their practice. In doing so, they create an experience-based learning environment. Participants may find that their attitudes and behaviours differ from those of colleagues, and that their beliefs are challenged by trustworthy data on their own practice performance or from suggestions in evidence-based literature. These dissonances may make them feel uneasy but, in the safe environment of the group, participants can then reflect on these differences and alter their attitudes and behaviours without fear of risking their professional identities.

QC participants learn and work collaboratively towards a common goal because they feel that success depends on the contributions of each member. They produce new ideas and concepts to improve their practice when they reflect on their own experiences and add information from other relevant sources, including patient complaints, narratives, quantitative data on diagnostic habits or prescription patterns, or discussion with specialists. This process satisfies the group and gives it a feeling of taking charge. Participants discuss the advantages and disadvantages of new ideas or new ways of working and discuss how to surmount barriers. They test innovations and implement them when they think they will be successful.

When QC participants repeat the process of implementing new ideas, they learn from their mistakes, gain confidence in their abilities and innovate in their daily practice. QC work becomes easier for them with each repeated cycle of QI.

What this research project contributes to our understanding of quality circles and how it relates to existing theories

The scoping review provided me with sufficient material to offer a common definition of QCs and similarly structured small groups and to describe their origins and intentions. I showed that the use of QCs has increased in Europe over the past 15 years, with their focus shifting from CME to QI (Beyer et al., 2003; Rohrbasser et al., 2019). I explored the benefits of QCs and their effectiveness

in changing behaviour in PHC. I realised that QCs are a complex social intervention in the ever-changing context of PHC (Rohrbasser et al., 2018). My research adds to our understanding of QCs by offering a programme theory that explains how, why and under which circumstances QCs may work in PHC (Rohrbasser et al., 2013). I can relate each step of the QC process to existing theories and threads of theories I gathered during my research and to the existing literature on the QC process. The QC process, and thus programme theory, focusses on motivating professionals to participate in groups in specific settings, fostering group learning and the exchange and creation of knowledge, and implementing innovations. I draw on a variety of theories and literature to explain the programme theory because QCs are the product of a complex process (see Table 9.1). Since the majority of the data on QCs relates to GPs, I focus on representing their perspective.

GPs want to feel that they can make useful changes and achieve desired results. They want to interact, be connected, care and be cared for by others. Finally, they want self-determination and the freedom to choose to participate in QCs. Self-Determination Theory suggests that GPs are motivated to participate in QCs if they feel that the QC will satisfy their basic needs for competence, social bonding and autonomy (Ryan and Deci, 2000). CMO configurations I a, I c, II b, II c, III b, IV b and IV e draw on self-determination theory and explain why GPs may participate in QCs, learn and demonstrate innovation.

Highly functional groups are essential to the QC process. A group is made up of people who interact and share identities, objectives and a common structure. The group size affects the level of cooperation between members and the effectiveness of meetings; the optimal group size for good communication is between five and twelve participants (CMO configuration II d) (Elwyn et al., 2004). Members of the group often bring diverse skills and knowledge to a task, so the knowledge and capacity of the group may be greater than the sum of the average of each individual's capacity. When participants share their knowledge and incorporate all perspectives, they can collectively solve problems more efficiently than they could alone (Kozlowski and Ilgen, 2006; Brennan et al.,

2012, Baumeister et al., 2016). This variety also stimulates discussions in QCs if participants have defined their role based on their expertise (CMO configuration II e) (Armson et al., 2007). Participants should have some power and operate on the basis of equality, so they feel accountable and responsible for what they do (Andres, 2004b; Armson et al., 2007; Baumeister et al., 2016). Accountability reduces the likelihood of, for example, individuals who lean back and reduce their efforts (social loafing) or just nod and melt into the crowd (group think) (Gubbins and MacCurtain, 2008; Baumeister et al., 2016). These threads of theories support CMO configurations II b and II c, describing the importance of setting group norms that help participants find their roles, take responsibility and have a sense of being in charge.

Participants in QCs can learn better if group members trust each other (Cross et al., 2001). When people trust each other and expect each other to respond kindly, they allow themselves to be vulnerable (Dirks and Ferrin, 2001). Trust implies that participants will treat each other well, according to the principle of benevolence, when they take risks and participate actively in the group. Trust grows as group members behave consistently, making the process more predictable. When members get to know each other well, they rely on their shared history to predict future behaviour and trust increases over time. Trusting relationships facilitate learning and open possibilities for sharing, creating and integrating knowledge (Gubbins and MacCurtain, 2008; Cross et al., 2001). CMO configurations III a, III b, III c, IV c and IV g of the programme theory heavily depend on trust as a foundation for success.

Skilled facilitation of the group process is key to successful QCs in PHC (Brennan et al., 2012). Facilitators use didactic techniques to support the group's QI process, observing and guiding the group and creating a safe atmosphere. Their skills and techniques create the necessary context in many of the CMO configurations of the programme theory; without these, certain mechanisms would fail. They facilitate the first social interactions that build the group's foundation (CMO configuration II b) (Pereles et al., 2002). Facilitators respect the group's process and do not try to

dominate it, instead guiding discussion in a supportive, non-threatening atmosphere. They can also challenge the group if members go off topic or try to avoid discussing controversial issues. Facilitators use purposeful didactic techniques such as brainstorming, contentious or consensus discussions and role play to create a positive learning environment (CMO configurations III f, IV c, IV d and IV g) (Rhydderch et al., 2006; Dogherty et al., 2010).

QCs work towards specific purposes within a wider organisation that supports, promotes or hinders their activity (Kilo, 1998). The parts of the programme theory that address the process at organisational level explain how organisations enable QCs and their participants to learn and create new knowledge. The PARiHS framework suggests that three elements must be in place before QCs can successfully implement innovations: 1) explicit or implicit knowledge, including QC members' interpretations of that knowledge; 2) the context, which must stimulate the use and evaluation of new knowledge; and 3) facilitation, which should meet professional standards to support the process of change (Kitson et al., 1998). Explicit knowledge can be easily explained and expressed by means of signs, language or writing because it is factual, e.g. a scientific presentation on a topic, guidelines, evidence-based information, useful information presented in text format or the presentation of data in the form of, for example, measurements of practice performance. In contrast, implicit or tacit knowledge is embodied in the knowledge or skills that a participant has accumulated through experience, and which they may not easily be able to communicate.

When QCs choose an issue, they require explicit knowledge. For example, they may choose to compare their own practice with clinical practice guidelines to improve their performance through a sequence of action cycles. Organisations should offer QCs continued feedback on their diagnostic or prescription habits in the form of reliable data. If an organisation values the knowledge developed by QCs to improve performance and resolve problems, it will also value the group's efforts and provide resources, which will in turn stimulate participants to undertake new projects. Organisations must accept the risk of failure because giving QC members the freedom to fail

encourages them to innovate. QC participants need access to scientific knowledge such as evidence-based medical findings so that they can recognise and close the gaps in their knowledge. Several authors describe these features as part of an organisation's receptive capacity: how well it values, integrates and uses new external knowledge (Lane and Lubatkin, 1998; Helfrich et al., 2010; Brennan et al., 2013). The PARiHS framework also stresses the need for a professionally facilitated process that meets the group's needs (Kitson et al., 2008). CMO configuration I b draws on these theories because QCs should be embedded in a system that provides training in QI and promotes QI by providing explicit knowledge, valuing tacit knowledge and ensuring that groups have competent facilitators (Brennan et al., 2012). The PARiHS framework and related theories on organisational contexts also contribute to CMO configuration III e, since access to trustworthy data (explicit knowledge) in an effectively facilitated group helps participants to identify their own learning needs (Kelly et al., 2007; Brennan et al., 2012; Brennan et al., 2013).

GPs in QCs are adult learners who desire active participation in the educational process rather than learning passively. Many programme theory CMO configurations draw on adult-learning theories. GPs prefer self-directed learning and need to understand what, how and why they must learn (CMO configuration I d). They are engaged in their work and are primarily interested in topics relevant to it. If QCs choose the issues on which to focus, the group will get the maximum benefit from the experience. GPs are knowledgeable and experienced and want to build on existing knowledge and experiences; CMO configurations I c, II b and III b draw on these threads of adult-learning theories (Mukhalalati and Taylor, 2019). GPs want to focus on relevant practical knowledge they can put to immediate use (CMO configuration III d) and wish to be treated with respect, since this maintains their professional dignity (Holton et al., 2001).

Much programme theory on QCs focusses on learning in groups. The terms social, collective or team learning have similar meanings; all describe the social interaction of participants who exchange knowledge to learn. Collective learning has a common goal, while social learning may

not (Knapp, 2010). CMO configuration III f draws on social-learning theory (Bandura and Walters, 1977), which asserts that learning is an active, cognitive process of perception and thinking in a social context that brings insights and gives meaning, thus increasing knowledge. Unlike behaviour-learning theories, which suggest that environmental stimuli provoke consequential learning, cognitive-learning theories claim that learners gain insights when they reflect on perceptions or new information (Mukhalalati and Taylor, 2019). GPs seem to learn when they observe and imitate peers. Hands-on training increases their skills and their confidence in their knowledge. They also learn from the responses they receive, or expect to receive, when they try something new, and they avoid actions that are unrewarding. Learning depends much on individual expectations and whether members feel competent to carry out actions; someone who believes they will succeed is more likely to try something new. If organisational factors lend support to learners, e.g. by giving access to learning material, incentives or rewards, this also improves the process (Bandura and Walters, 1977; Bandura, 2001).

GPs prefer experiential learning, in which experience is the starting point. Learners reflect on an experience and its possible causes, which leads them to develop generalisable abstract concepts. Concrete experience restructures the learner's knowledge, turning insights gained from experience into knowledge that can be transferred to other situations. When learners actively experiment with the knowledge they acquire from experience, they can then bring stories of their experiences back to the group and a second cycle begins (Kolb, 1984; Kolb et al., 2001). Experiential learning addresses the need of GPs for an emotive connection with their everyday practice. CMO configurations III b to III e draw on these threads of adult-learning theories. GPs are not 'produced' through book-learning alone; students and young physicians have to learn how to think and to act like GPs to truly join the profession. In QCs, participants share knowledge and experience which then validates or corrects clinical reasoning (Pereles et al., 2002). They integrate tacit and explicit knowledge and develop professional values such as integrity and empathy (Eraut, 2000; Oborn et

al., 2013). CMO configurations IV g and V a show the need for tangible experiences and the repeated attempts necessary for new knowledge to be absorbed.

As adult learners, GPs integrate new knowledge into an existing pattern, as described in transformative learning theories (reflecting learning theories). Transformative learning begins with cognitive dissonance, a negative emotional state triggered by conflicting perceptions or reasoning (cognitions). These can be contradictory attitudes, beliefs or behaviours that create unease (Eva et al., 2012; Eva and Regehr, 2013; Brennan et al., 2017). People reduce feelings of a lack of harmony in different ways. In well-functioning QCs, cognitive dissonance compels GPs to reflect on, accept and adopt new reasoning, and sometimes requires them to change their old ways of thinking. They will risk doing this in a group where they feel safe and confident (CMO configurations III e and IV g) (Newton et al., 1992; Payne and Hysong, 2016; Van Braak et al., 2019). Self-reflection drives GPs to search for options and acquire knowledge and skills to try out new roles. Their confidence in their new knowledge grows and they integrate it into their practice (Mezirow, 1997; Sandars, 2006). Cognitive dissonance can also drive fruitful discussion if it does not threaten a participant's professional identity (CMO configurations II e and II f).

In QCs, social interdependence theory provides a useful frame within which collective or social learning may flourish (Johnson and Johnson, 2005). Positive interdependence is achieved when QC participants realise that they can only accomplish their goals if they also help their peers to do so. Positive interdependence fosters mutual encouragement and support in pursuit of the group's ends (Fiske, 2015). For example, QC members may take on each other's tasks (substitutability) or be open to new ideas and suggestions. They give their peers feedback and information that helps them in their work, but they also challenge each other, helping members and the group to make better decisions. The awareness that their own success increases the likelihood of the group's success seems to instil a sense of responsibility to the group. Positive interdependence motivates participants to work harder and pushes them to adopt new thinking strategies. CMO configurations

IV a and IV c draw on this theory, explaining how a QC's members collaborate to achieve a common goal. Positive social interdependence improves psychological well-being and increases self-esteem, perhaps through cooperation with peers and mutual appreciation, which may reduce burnout among participants (Eliasson and Mattsson, 1999; Johnson and Johnson, 2009; Zaher and Ratnapalan, 2012; Rohrbasser et al., 2018).

The programme theory on QCs also helps to explain knowledge exchange and creation (knowledge creation theories). When GPs discuss and reflect on their own cases, this activates existing (tacit or implicit) knowledge based on their everyday work. Tacit knowledge is rarely documented but GPs make tacit knowledge explicit when they talk about their experiences. Hildreth and Kimble (2002) argue that it is impossible to completely separate implicit from explicit knowledge or, as they call it 'soft from hard' knowledge. Soft knowledge has a core of hard knowledge and vice versa, so all knowledge is to some degree both hard and soft. GPs can articulate hard (explicit) knowledge more easily than soft knowledge (Hildreth and Kimble, 2002). When GPs decide on and plan changes, they must balance local expertise (soft or implicit) against wider (explicit or hard) knowledge. The group generates new concepts and ideas as members reflect on their own experiences (soft or implicit knowledge), discuss individual cases, add information from sources that illustrate their practice (explicit or hard knowledge) and then compare their current practice with evidence-based educational material. Each member increases the group's knowledge by contributing their perspective and, together, they present a spectrum of different views that will, ideally, range from the micro view of single-patient care to a wider view of the whole system. The group develops ideas to improve care or work differently and then justifies them with data from practice and evidence-based recommendations, adjusting for local circumstances if necessary. A key function of the QC is to merge familiar knowledge, local context and personal experience with evidence-based knowledge. CMO configurations III c, IV e, IV g and V g draw on the organisational knowledge creation theory of Nonaka et al (1994): implicit knowledge becomes explicit when people articulate it and then combine it with new explicit knowledge to innovate and then test the innovation

repeatedly to internalise or embody that knowledge. Finally, the innovation is conveyed to others through demonstration (Nonaka et al., 1994; Eraut, 2000; Gabbay and le May, 2004; Eraut, 2007; Orzano et al., 2008). The authors stress the importance of supporting environmental conditions that enable people to create knowledge, such as the receptive context described in the organisational perspective section (Von Krogh et al., 2000; Nonaka et al., 2006).

The programme theory explains the use of innovations or behaviour change as a possible consequence of an intention. The theory of planned behaviour postulates that intention is influenced by the attitude of people towards a behaviour, perceived social pressure, subjective norms or perceived behavioural control. Before people change their behaviour, they ask themselves whether the new behaviour is sensible, what others think about the practice and how easy or hard it is to change (Ajzen, 1991; Eccles et al., 2012). A systematic review supports the argument that GPs follow their intentions with behaviour change, in line with CMO configuration IV f (Eccles et al., 2006).

Participants in QCs claim psychological ownership when they feel that they are part of the group and control the process that creates new knowledge. As described in CMO configuration IV e, ownership gives GPs a sense of satisfaction and they feel responsible for what they do (Veninga et al., 1999). If participants make personal or financial claims based on psychological ownership, however, this may lead to conflict and dysfunctional behaviour in the group (Pierce et al., 2001).

The term automaticity captures the ease that comes with performing tasks repeatedly in a QC (Logan, 1990). The literature and my interview data suggest that QC processes must be repeated, especially during the phase when GPs are implementing new knowledge, to embed the behaviour changes in everyday practice (CMO configurations V a and V b) (Poldrack and Gabrieli, 2001; Hauptmann and Karni, 2002).

Implications of the findings and recommendations

Data from various trials and interviews at different stages of this research project demonstrate that those who organise QCs should create supportive conditions that generate enthusiasm among GPs and maintain their motivation to participate. Based on these data, I can also offer recommendations for the QC process to increase the likelihood that GPs successfully improve the quality of their work. Each recommendation is based on one or more CMO configurations (see Table 9.1).

GPs should be obliged to take responsibility for their QI. In Switzerland, for example, at the national level, the Federal Office of Public Health entrusts GPs with QI. Although GPs should be allowed to decide what they do and how they perform QI, the literature and interviewees argued that a degree of obligation should be tied to this autonomy (CMO configuration I a).

Knowledge in QI tools and facilitation skills matter. When professional PHC associations or university departments start groups to improve QI, they should introduce basic principles such as the Plan-Do-Study-Act cycle (PDSA) and explain how to implement them in QC practice (CMO configuration I d). They should also support GPs professionally and provide access to evidence-based information and rewards (such as CME credits) to acknowledge QI work as further education. The facilitator's role is of such importance and covers so many areas that professional associations should offer facilitator training and further coaching or supervision. Professional associations or university departments are also best placed to support facilitators when they need access to knowledge resources including clinical practice guidelines, service delivery and organisation guidelines or information about potential QI topics. They should also offer support to GPs who want to collect, compare and interpret their practice performance data. Where possible, health-care professionals should be actively involved in collecting the local data needed to address their local priorities, as this increases trust in the findings. (CMO configurations I b and II a).

QCs need assistance with administrative tasks. Organisations such as physician networks should provide administrative support to help the QC access appropriate venues and arrange meeting times (CMO configurations I b and II a). They should value, integrate and use the new knowledge developed by QCs, so that GPs can see that their efforts have changed practice. GPs in QCs need protected time, so groups can work during regular working hours or at mutually agreed pre-arranged times. The process should not be disturbed by phone calls or urgent patient problems, since these disrupt discussions. Managers must accept that QCs work at different speeds, because excessive demands for rapid results often undermine QI efforts. They must also accept local adjustments to national solutions or guidance, because QI is a local process and QCs will adapt or devise new interventions and new ways of working (CMO configuration I c and IV a). There is limited literature on how to transfer the solutions developed by QCs to other regions or settings and solutions may not fit other regions in other contexts. It makes sense, however, to have a process for sharing solutions so that facilitators of other QCs can access and learn from ongoing and earlier work.

The role of the facilitator, who may be a GP or a non-GP with appropriate skills, is key for QI. To fulfil their role, facilitators need basic training, and further coaching or supervision should therefore be provided. Facilitators should create an atmosphere of openness based on trust, so that participants can interact authentically. They should open discussions, summarise, clarify statements and raise questions (CMO configuration II b). Facilitators should encourage participants to talk about their own clinical cases, because these form the basis of a learning community where participants can reflect on their current practice and compare it with educational or evidence-based material such as guidelines. They try to achieve a balance between comfort and challenge allowing an appropriate degree of conflict within the group (CMO configurations III a, III b, III c and III f). Facilitators should close meetings on time and plan future meetings by summarising progress and highlighting the goals that have been achieved (CMO configurations II b, IV c and IV d).

For QC participants, breaking established habits may feel high-risk and even threaten their self-image. Individuals who feel this way may choose to withdraw or, still worse, disrupt the group process (CMO configuration II f). Timely identification and resolution of conflicts is one of the more difficult tasks, since disrupted groups cease to be effective. Facilitators may need to help participants to express themselves since it can be hard to make implicit knowledge explicit. Participants require 'active empathy' when they struggle to express their thoughts (CMO configuration III b). This is the ability of QC members to actively listen to and care for each other, even when they question each other's statements.

The social aspect of the group lays the ground for frank discussions. Having a meal or snacks together before starting work eases social interaction, making participants feel more comfortable. By arranging this, facilitators can make their own work easier. A friendly, relaxed and non-hierarchical atmosphere encourages participants to share sensitive information and motivates their continued attendance. Removing barriers such as computer screens, and arranging tables and chairs in a circle eases social interaction (CMO configurations I c, II b, II c and III a).

Agreeing which topic to focus on is central in QC work. The group must have a shared understanding of the problem when they embark on the QI process and the topic must be relevant to everyday practice and manageable. The group should agree on the need for change, or at least agree that a problem exists. The literature shows that GPs will rarely change their behaviour if they do not believe it needs to change. A balance must be struck between central direction of QCs and local autonomy to decide what matters most in their areas. The maturity of the group will also determine the most productive topic to focus on. QCs may wish initially to focus on relatively simple problems where there is a clear consensus, to establish processes on which longer term collaborations can be built (CMO configurations II c and III d).

Coming to an agreement on how to address the topic is dependent on balancing local expertise with wider knowledge**.** Once a topic is chosen, GPs should start with their own experiences. Discussing

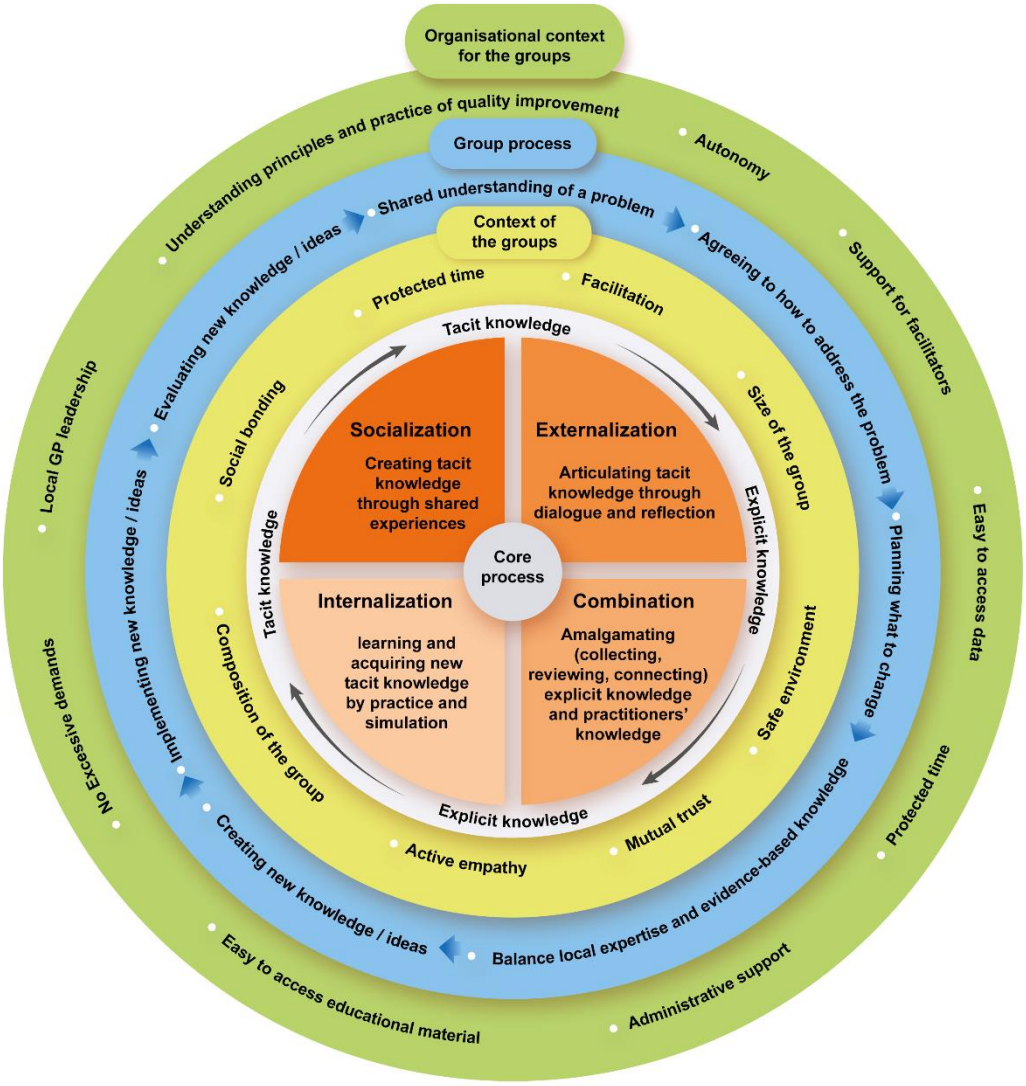
personal cases increases a sense of ownership and helps participants to connect the subject matter to their everyday practice, increasing their professional competence and confidence. Participants can examine their current practice, comparing it to guidelines, educational evidence-based material, prescription data or input from a respected local opinion leader (CMO configurations III b, III c and III d).

Plans for change must also balance local expertise and wider knowledge. The group develops new concepts and ideas by reflecting on the experience of its members, including discussing individual cases, adding information drawn from other sources that illustrate their practice, and then comparing the current status of their practice with contemporary, evidence-based educational material. Since knowledge depends on perspective, each group member can contribute, and group members express a range of different views. Ideas about how to change and improve care, or work differently, have to be justified by data from practice and by evidence-based recommendations and these may have to be adjusted to fit local circumstances. A key function of the QC is therefore merging knowledge based on familiarity with the local context and personal experience with knowledge based on external evidence (CMO configurations III e, III f, IV a and IV c).

Implementing innovation is a continuous, iterative process. The advantages and disadvantages of new ideas or changes to practice must be discussed and barriers addressed (CMO configuration IV d), so the group should debate the proposals for change and agree on action plans. After testing and trying out these plans, the group may then choose to move forward with one or more of them, depending upon how sure it is that the plans will be successful (CMO configuration IV e). Each time they test the innovation, group members should seek to improve it, based on their own practice and devise a plan to implement the next version (CMO configurations IV g and V a). QC groups have a learning curve and improve their skills and performance after each QI cycle (CMO configuration V b).

The infographic in Figure 10.1 highlights all the issues that are important to consider in ensuring that QCs function effectively.

Figure 10.1 Summary of the QC process and its implications



The rings represent the levels of context and their associated processes. The core process is in the centre, illustrating the exchange of knowledge and the creation of innovations in QCs. The process is a spiral rather than a circle, because participants add experience and new knowledge at each turn of the cycle. The size and composition of the group, the social bonds between participants and their mutually benevolent attitude all foster mutual trust and create a safe environment in which

participants can have frank discussions. Protected time and skilful facilitation lay the groundwork for a successful core process. At the next level, participants begin with a shared understanding of an issue and agree how to address it and what needs to be changed, ensuring the success of the group process. When QCs solve problems and innovate, they should balance local expertise (soft knowledge) with evidence-based information (hard knowledge); then they can generate new ideas to be tested and implemented in everyday practice. The QC process requires considerable professional and administrative support at the organisational level, so professional associations or university departments must teach QC members the principles and practices of QI and their use, and train and support facilitators. Organisations should also provide easy access to performance data and evidence-based material. Administrative organisations, whether health insurance companies or governmental organisations, should allow QCs to have professional and administrative autonomy and let them take the lead in QI, without placing excessive demands on the group or its members. The level of legislation required to entrust GPs with QI will vary depending on a country's health-care system, and could be enacted at national or local government level.

My outputs and dissemination strategy

The participatory approach I adopted actively involved QC participants, facilitators, tutors and managers in Switzerland, and European EQuiP members. These colleagues have helped me spread knowledge about the content and the process of my research within Switzerland and across Europe. The EQuiP conference in Switzerland in 2015 focussed on this topic; representatives from 27 countries met and discussed the intermediate findings and contributed their expertise to the development of the programme theory on QCs. In 2016, at the European WONCA conference, I held two workshops and gave several short talks on QC processes, followed by discussions with colleagues from various countries. They confirmed the intermediate findings and I learnt about how QCs operated in their countries.

I published the scoping review on the definition, conduct and spread of QCs in the journal PLOS ONE (Rohrbasser et al., 2018). The scoping review contributed to a common understanding of what QCs are in Switzerland and in the European countries represented in EQuiP. I also published a paper describing the core characteristics and spread of QCs in the *Scandinavian Journal of Primary Health Care* (Rohrbasser et al., 2019). Recently, the Institute of Primary Health Care in Bern (BIHAM) used my programme theory to conduct a quality improvement pilot study in QCs. It helped the researchers to adapt an intervention to the needs of QCs where participants learnt to offer patients the choice to have colorectal cancer screening (Martin et al., 2019).

At the Swiss national level, I founded the Swiss Forum for Quality Circles in 2016, which includes representatives from 11 professional associations who use QC for CME/CPD and QI (Rohrbasser, 2020). The Swiss Forum implemented my recommendations in QCs as part of its joint basic training and teaches others how to implement them at yearly national meetings for facilitators. My results were timely; QCs have spread and developed rapidly as a result of physician networks and health insurance companies signing collaboration contracts. For example, Medbase, a physician network, created a cohort of their diabetic patients and asked the Department of Health Economics in Winterthur to collect clinical and economic outcome data that it forwards to QCs, which then use that data to improve their practice. In another example, the Swiss Society of General Internal Medicine asked QCs to study proposals of non-recommended medical procedures provided by Choosing Wisely, an international initiative to avoid unnecessary medical tests, treatments or procedures. QCs will be asked to use the evidence-based recommendations and educational feedback provided by researchers at the University of Geneva, and link them to their own experiences. The researchers will then evaluate whether this process results in a reduction of variation in practice.

At the European level, I founded a working party on QCs within EQuiP in 2015 to disseminate my research findings and to encourage member countries to form QCs. The EQuiP working party will

use my recommendations to create a supportive context and strengthen the QC process by developing teaching material for training and sharing it with participants, facilitators and organisers of QCs. Since health-care systems differ widely across Europe (including insurance, state-based or mixed models) and academic and professional institutions also vary, the organisations that take responsibility for the administrative or professional support of QC will not be the same from country to country. The EQuiP working group will build networks between countries with similar structures so that they may learn from one another. EQuiP representatives will organise local meetings in their home countries to spread the programme theory and explore its local implications. They will also organise workshops at national and international conferences, e.g. the WONCA Europe Conference, where QC participants, facilitators, organisers and other health-care professionals can gather to exchange knowledge about QCs. The EQuiP QC working party supports the local development of QCs from their start and also supports existing QCs to develop further, adapting its teaching material to local needs and circumstances. For example, in March 2016, I shared my knowledge of how to establish QC groups for collaborative QI in Scotland and published a briefing paper that included recommendations based on the programme theory (Rohrbasser et al., 2017). In May 2016, I trained the first facilitators and supported the development of a growing network of QCs in Croatia. Due to the COVID 19 pandemic in March 2020, the EQuiP working party had to reschedule meetings and workshops on how to use QCs in PHC in Belgium and Slovenia.

Future research

Because I developed my QC programme theory with rigour, I have confidence that it explains when QCs are likely to work, to what extent, for whom and in which contexts. In common with any theory, however, it would benefit from additional testing with the goal of confirming, refuting or refining it. To test the theory, I would have to examine each CMO configuration in situations when QC members intend to improve their quality of work. The programme theory on QCs must be

tested in the real world and, because QCs choose the topics they discuss, I would have to suggest an attractive topic to spark their interest.

The following is an example of the type of future research that could be used to further our understanding of QCs and their implementation in our health system. At the request of the Federal Office of Public Health and physician networks, I drew up a plan for a QC intervention to reduce unnecessary antibiotic prescriptions. Although Swiss GPs prescribe antibiotics cautiously, they still overtreat some common self-limiting infections, like acute uncomplicated urinary tract infections in women, otitis media or acute pharyngitis. The plan is an educational intervention where GPs learn more about self-limiting infections and how to use decision aids to help patients or their parents participate in treatment choices when antibiotic prescriptions may not be necessary. Some GPs may be aware of the need to reduce prescription rates but want to meet the patient's expectations of a prescription, while other GPs, or their patients, may overestimate the effectiveness of antibiotics or underestimate the incidence of adverse events (see Appendix 10.1 for the preliminary protocol). At the BIHAM, we will use the programme theory on QCs to design the intervention, i.e. an educational intervention in QCs where participants learn about self-limiting acute infections and how to use decision aids. We will evaluate the results taking a realist approach. The Federal Office of Public Health accepted our plans and provided a generous grant that allows us to conduct the study.

Strengths and limitations

One limitation of the realist approach that I followed throughout is that it relies on the detail and depth of the reports I identified in the literature review and the quality of the data I collected in my interviews. Although I collected data from different sources, the accuracy of my findings depends on the truth of what the authors reported in the literature and on what participants revealed in interviews. To ensure I found the greatest variety and the most detailed published literature available, I searched for related reports and papers (families of papers) that discussed different

aspects of the same or similar research projects. I was aware that interventional study designs such as RCTs approximate closed systems, in that they report on a limited number of factors that influence outcomes, while complex interventions operate in open systems where many factors may affect the outcomes. I thus searched for qualitative papers and evaluations of research projects or similar research projects that proposed other possible explanations for their findings.

I used data from sequential interviews to develop my programme theory step-by-step as it emerged and tried to ensure that my progress was transparent. I chose groups of people with different perspectives (QC participants, facilitators, tutors, organisers and managers) to contribute to the programme theory, confirm the adequacy of certain statements or explain their meaning. The majority of the participants were not native English-speakers, so I conducted some of the interviews and focus groups in Swiss German, which meant I had to translate the transcript into English. Any translation carries the risk of losing or altering meaning. I conducted the Phase IV interviews in English, so some of my colleagues may have found it hard to express themselves, again creating the risk of incomplete interview data or misunderstandings. My interviewees may have wanted to give the answers they believed I wanted to hear, creating the risk of social desirability bias. It is possible that focus groups fell into 'group think', where people align their views with the opinions of the group. I mitigated this risk by carefully posing neutral interview questions. I tried to avoid making assumptions in my questions and concentrated on what would be meaningful to the participants and what would help me to answer the research-related queries. Finally, I took on the role of participant-researcher, which poses a risk of interpretive bias that may influence the course of the interview. I tried to reduce this risk by continuously reflecting on my role during interviews.

The realist approach also carries the risk of selective bias if researchers choose underlying theories and synthesise them ad hoc. To mitigate this risk, I invited representatives of various organisations, policy-makers, and QC users at different levels to collaborate on and create the basic research plan.

I took a participatory research approach, asking different players to contribute their perspectives as we developed the research questions, methods and analysis, and when we considered the implications of my results. These participants provided me with a preliminary programme theory that guided the systematic development of my own theory, which evolved as I consulted the literature and conducted iterative interviews and focus groups. I presented my preliminary findings at workshops during the WONCA conference in Copenhagen in 2016 to learn what GP colleagues from various countries thought about them. In the end, this programme theory is an approximation, valid in limited contexts since it was impossible to be exhaustive.

This research project was strengthened by its reliance on multiple methods and data sources. I used a variety of types of published study, books and grey literature on QCs, including documentation, manuals and websites. I gathered data from several sequential interviews with the various participant groups so that interviewees had the opportunity to check my interpretations and use of their data. This helped me avoid misunderstandings and misinterpretations, and allowed them to grant me permission to publish their statements. Since the QC community is small, anonymity is hard to maintain and consent was key. Finally, I received external feedback and advice from my supervisors, who helped me to keep my analyses, interpretations and data-driven inferences focussed on the research questions. They reviewed each step of my research process, and assisted me in developing the programme theory and reaching a comprehensive understanding of successful QCs.

Personal reflections

When I think about my experiences during the course of this thesis, I realise that I have made a very personal journey, moving away from my habitual, clinical, and mostly empirical way of thinking towards a theory-based method – the realist approach – so I could answer my research questions. As on any journey, some of my memorable experiences were the result of diversions or getting stuck in thought loops that put me out of my comfort zone; these experiences changed my

thinking.

Initially, my research was chaotic and very unsettling. I had decided to work collaboratively and to engage interested stakeholders (QC participants, facilitators, tutors, managers) and policy-makers to help me identify the problems posed by QCs, narrow my research questions and interpret my results. I adopted a participatory style so that we could learn together in a respectful partnership and thought I could develop my research plan step-by-step. However, I found I could not control the time or place of the discussions, many of which were unplanned and extended beyond the topics for which I had prepared. The journey took on its own momentum and I had difficulty regaining control over it. To put it bluntly, the process of co-inquiry with experts, whose opinions and advice I had solicited to focus my research questions and build a preliminary programme theory, was not as orderly as I would have wished. Those I spoke to were highly motivated to help me; since I wasn't prepared to audiotape often spontaneous meetings, I kept minutes and wrote protocols that I gave to participants later to check and augment.

I asked myself several times how I could have made a smoother start. It would have been helpful to precisely plan the times and places of meetings and draft an agenda, but my own experience with QCs had taught me that insisting on a strict structure for meetings could inhibit spontaneity and creativity. When I focus on the output, the fact that the participants helped me to narrow down the research questions and provided me with a preliminary programme theory, I am content. I learnt that I had to be patient and tolerant when using a collaborative, participatory research approach.

At the time of the co-inquiry, I felt insecure about the academic value of my research. I wondered if QCs were significant enough to be the focus of research and wondered if there was sufficient published literature to allow a realist review, but I had superb support from a librarian and my supervisors. During the scoping search, I learnt that 'QCs' had different names in other countries, but shared the same purposes and processes (Rohrbasser et al., 2018). I was pleased that authors reported not only the results but also what happened in QCs, which is essential for a realist review.

I then conducted a survey across European stakeholders and learnt that QCs were becoming increasingly significant in some European countries (Rohrbasser et al., 2019). With the results of these two preparatory papers under my belt, I felt more confident about the academic value and the significance of my research.

The most demanding and time-consuming part of my studies was preparing to conduct interviews at the different stages. After the first, rather chaotic, phase, I understood that I had to be well prepared when I approached possible participants. Ethics requirements and my supervisors' recommendations encouraged me to pose appropriate questions at the right time so that I could further refine the evolving programme theory. I also had to prepare to interview my colleagues in professional associations at both the national and European levels. The fact that we spoke different languages posed problems. In Switzerland, when I conducted interviews in Swiss German, it was difficult to preserve the original meaning when translating quotes. When I held interviews with colleagues from other European countries, I tried to keep to English but participants sometimes struggled to express their thoughts and switched to their native language or German. I realised how important it is to be able to express thoughts in one's native language and to create a relaxed atmosphere during a foreign-language interview. The community of people interested in QI in PHC is quite small, so most of us have personal as well as professional connections. As a result, interviewees sometimes made very personal comments and statements that were not related to the research project. I had anticipated this and my plan was to address them and return as quickly as possible to the interview guide. This strategy worked well. I also expected that interviewing colleagues and friends might increase the risk of social desirability bias or group think. I had prepared myself for this too and maintained a reflexive attitude during the interviews.

Academic writing in English was a challenge. Syntax varies by mother tongue and it was hard to shift to an English academic narrative style from the passive structures of Swiss German and Swedish. Writing in English helped me to acknowledge, assemble and connect my thoughts and

articulate insights, although I had to take the time to let the thoughts emerge. It took me hours and sometimes days to organise my thoughts so that I could put them down on a piece of paper. I was not always fully aware that there were times when I was absent-minded, distracted and not very sociable, but people around me did. I was apparently deep in thought until I was able to write down what I was thinking.

During the course of my studies I was increasingly convinced that QC work is about more than just CME or QI in PHC. My understanding of the role of QCs was initially quite narrow, but it expanded as I worked on my DPhil. I now realise that, when participants share their experiences, they can also recount their fears and perceived mistakes in a safe environment, which can improve their professional self-image. The exchange of experiences among peers makes participants aware of their routine practices and enables them to reflect on and evaluate their way of working. This supports professional development, as peers may share alternative approaches or actions that colleagues can try in difficult situations. In interactions with their patients, GPs often reach the limits of evidence-based medicine and must rely on their art (James, 1999). Authors including Montgomery argue that medicine is neither a science nor an art form, but an interpretive practice that relies on clinical reasoning (Mongtomery, 2005). QC is a forum where participants can learn how to practice medicine.

Representatives from several European countries are very interested in my research and I have made professional connections and gained access to opportunities I might otherwise not have had. My peers in EQuiP supported my idea of a European working party on QCs. We developed basic educational material based on my research, and planned and held several talks and workshops about QCs and QI. I had the opportunity to train the first facilitators in Croatia and to hold workshops in Scotland when groups for collaborative QI in PHC were first introduced there (Rohrbasser et al., 2017). At congresses in Copenhagen, Dublin, Basel and Zurich, I was invited to present my research on QCs (Martin et al., 2019). My supervisors made it possible for me to

manage all these tasks. Although the project is almost complete, my colleagues are still supporting me and are keen to implement the new insights.

Representatives of several Swiss associations of health-care professionals were also very interested in my research. Thanks to project funds raised by the Swiss Society of General Internal Medicine (SSGIM), I was able to found the Swiss Forum for Quality Circles that organises joint basic training and continuing training courses for facilitators and now comprises eleven professional associations assembled to improve QC implementation. I may represent the QC movement to the quality commission of SSGIM as a permanent member and was very pleased to see that SSGIM delegates chose QCs as one of their mandatory quality activities for compliance with the current Federal Law on Health Insurance.

It is still necessary to keep in mind that the programme theory I proposed in this research project only approximates to reality and must be tested and refined in future studies. After completion of my DPhil, I will continue working at the BIHAM and continue to incorporate realist and other methodological approaches into my research. I will contribute to further studies designed to improve and implement QCs as means of QI in PHC. In my role as a teacher and trainer, I will work with my Swiss and European colleagues to develop and continually improve training materials for facilitators and participants.

Since my studies at the University of Oxford, teaching basic clinical skills to medical students and future GPs feels different. Perhaps it is more rewarding because learning to think like an academic has made me more reflective about what I am doing and about the different roles I play in various situations. It has also made me more aware of my role as a GP in patient contacts. I will continue working part-time as a GP because I am emotionally connected to the patients I have been following over last 20 years, who often share fascinating stories.

Conclusion

The contextual requirements for successful QCs are governmental trust in GPs' abilities to deliver QI, and appropriate professional and administrative support for QC work. Professional support includes training in QI techniques, easy access to teaching materials and trustworthy personalised performance data. Administrative support includes the provision of protected time, an appropriate venue and financial resources for meetings. Furthermore, participants in QCs need to feel that they have a say in their CPD and QI work without excessive demands if the groups are to be successful. Several factors or components in QCs influence practitioner performance. The QC members and their group dynamics are at the core of the process. Facilitators help participants to build social bonds and mutual trust so that QCs become a safe environment where open discussions take place and where participants link insights to everyday practice, manage uncertainty and develop their professional role. They reflect on their own experiences, add information from relevant sources such as evidence-based information or their own performance data, and thus develop new ideas and concepts to improve their practice. With skilful facilitation, they work towards a common goal and test their new ideas in the group, knowing that success depends on the contributions of each member. QI is a cyclical process, and putting innovations into practice is therefore a continuous and iterative process in which participants gain confidence in their innovation and QI skills.

Acknowledgements

Studying for the degree of DPhil in EBHC in Oxford has been a wonderful but challenging learning experience. I would like to thank all the tutors and the staff at the Department of Continuing Education who encouraged me to develop my ideas. Many people have given their time for discussions, meetings and writing emails, thus providing me with contributions and feedback. I would especially like to thank Dr Geoffrey Wong, who diligently gave me valuable and constructive comments along the way as I developed my research skills. I would also like to thank Dr Janet Harris, for her input regarding the challenges presented by the realist approach for any researcher in education, and Sharon Mickan, who encouraged me patiently when I doubted the academic value of my work in the beginning. Without Nia Roberts, an experienced librarian, I would not have resolved the problem of finding adequate search terms to track evidence in the jungle of the databases. I also thank Kali Tal, a scientific editor at the Institute of Primary Health Care (BIHAM), University of Bern, and Alison Bellhouse, an English teacher, for their patience as I developed my academic writing skills. Finally, I thank my family for their understanding, because working as a GP and studying at the same time were a real challenge to a work-life balance.

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Appendices

The appendices include some of my original notes. As I am a not a native English-speaker, there may be misspellings or sentences that are incomplete or grammatically incorrect. My apologies for this and I hope it does not distract you, the reader.

Appendix Chapter Four

Appendix 4.1 Search strings for the scoping search

Search Strings: these three blocks are combined with the AND Boolean operator

"Quality Improvement" terms

	Quality Improvement terms
1	Quality Assurance, Health Care/Total Quality Management/
2	Quality Improvement/
3	"Quality of Health Care"/
4	Evidence-based practice/ or evidence-based medicine/ or evidence-based nursing/
5	Physician's Practice Patterns/
6	exp Professional Competence/
7	Guideline Adherence/
8	(Quality adj3 (improv* or assurance or change)).ti,ab.
9	(Practice adj3 (improv* or change)).ti,ab.
10	((Care or healthcare) adj3 (improv* or change)).ti,ab.
11	((Professional or physician* or medical or clinical or nurs*) adj competenc*).ti,ab.
12	((Guideline* or guidance or standard* or protocol*) adj2 (adhere* or complian* or concord* or implement*)).ti,ab.
13	(Evidence based adj2 (practice or prescrib*)).ti,ab.
14	1 or 2 or 3 or 4 or 5 or 6 or 7 or 8 or 9 or 10 or 11 or 12 or 13

"Group" terms

	Group terms
1	Peer Groups/
2	Group*.ti,ab
3	Group Process/
4	Group Practice/
5	Practice based.ti,ab
6	Facilitation.ti,ab
7	Facilitator.ti,ab
8	1 or 2 or 3 or 4 or 5 or 6 or 7

"Primary Care" terms:

	Primary Care Terms
1	General practice/ or family practice/
2	Primary Health Care/
3	General practitioners/ or physicians, family/ or physicians, primary care/
4	Community health services/ or community health nursing/ or community mental health services/
5	(Family adj3 (practice or practitioner* or physician*)).ti,ab.
6	(General adj3 (practice or practitioner* or physician*)).ti,ab.
7	(Primary adj3 (care or healthcare)).ti,ab.
8	(Community adj2 nurs*).ti,ab.
9	1 or 2 or 3 or 4 or 5 or 6 or 7 or 8

Appendix 4.2 Possible ways of exploring QCs

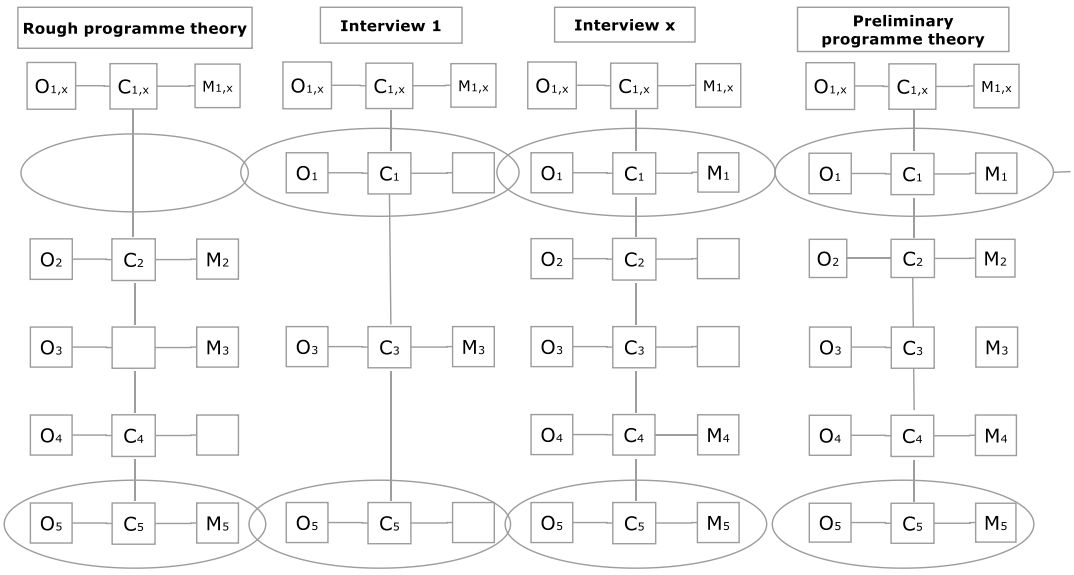
Possible research questions
What is the user's understanding of the programme?
Is the programme used consistently or is it altered in some way?
How do contextual features affect QCs?
How do previous or (co) existing programmes affect QCs?
Are there long-term effects like habituation or self-defeating elements?

Appendix 4.3 Questions for interviews and focus groups in Phase II

"WHAT are QCs?" – "What happens in QCs?"
This question should prompt participants to describe the phenomenon.
What do you actually do in QCs?
What facilitating techniques do you use?
What steps in the circle of Quality Improvement are important to you?
"When do QCs take place?"
This question served to gather data about contextual features.
When do your QCs take place, is it during work days, evenings, at lunch time, some other time?
"Where do your QCs take place?"
This question serves to gather more data about contextual features.
Where do QCs take place, do they take place at work, at home, in a library, another place?
"Why do you organize QCs"? – "What are the reasons for organizing QCs?"
This question should prompt the participants to explain QCs' intentions and purposes.
Why are they important to you?
Are they suitable for CME /CPD?
"How and why do QCs work?"
This question should prompt the participants to elaborate on how QCs exert effect and change patterns of behaviour and provide some ideas about underlying theories.

What are the motivational factors that make you participate in QCs?
What are the incentives you have to take part in QCs? Is it money, power, prestige, honour or fear of criticism?
How do differing contexts influence QCs, for instance if they are voluntary or mandatory, paid or not paid, autonomous or not?
How can the programme be improved?
How worthwhile, significant or important is the programme to stakeholders?
How do you evaluate your QCs?
"What would you like to get out of this research?"
This question was to narrow down the research questions to the essential points that are interesting to the stakeholders.
EQuiP
"Think about a well-performing QC – what do you think is essential for a QC to succeed?"
"Think about a failing QC – what do you think makes them fail?"
"What would you like to get out of this research?"

Appendix 4.4 Analysis of interviews in Phase II



santémed CEO		
	"WHAT are QCs?" – What happens in QCs? – aims to describe the phenomenon!	
	What do you actually do in QCs?	
FMH	*Ärzte mit ähnlichem fachlichem Hintergrund treffen sich zur Problem Besprechung / Diskussion.* *Sie öffnen sich, finden die Probleme und lassen eine reflektive Lösung zu;* *Die Themen sind praxisnah und somit brennend und interessant.*	
MFE	*Austausch* *• Man wählt ein Thema, das alle interessiert und bearbeitet es* *• Es findet ein Austausch von Wissen und Erfahrung statt* *• CIRS Forum: ein Ort / Gruppe von Leuten, wo die kritischen Erlebnisse verarbeitet und besprochen werden können* *• Deskriptive Forschung wird betrieben* *„Selbstverwaltung" findet statt* *• Protokoll – eventuell Dissemination im Netzwerk* *Wissenstransfer* *Bearbeitung von Guidelines* *Weiche Faktoren* *Stilles Wissen wird ausgetauscht und zwar informell bezüglich verschiedenster Ebenen der sozialen Ebenen im Berufsalltag -*	
Sanacare	*Fokussiert auf ein Thema wird moderiert frei diskutiert und erarbeitet,* *was man wie verbessern könnte*	
MediX_Bern	*8-14 Ärzte treffen sich regelmässig – wenigstens 10/Jahr sind obligatorisch* *EQUAM schreibt Themenbereiche vor: 2x Guidelines, 2 CIRS, 1 PPO und 1 EBM Seminar, sowie Drittleistungen. Die Form hierzu ist doch frei.*	
	Automatisch teilt die Gruppe das auf in Themen: *Diskussionen über Fälle, Überweisungen, Artikel (Journal Club), Guidelines, „Administrative Issues"*	

Appendix 4.5 Search strategy in OVID Medline / EMBASE / PsycInfo

PRIMARY HEALTH CARE TERMS

1. general practice/ or family practice/
2. Primary Health Care/
3. general practitioners/ or physicians, family/ or physicians, primary care/
4. community health services/ or community health nursing/ or community mental health services/
5. (family adj3 (practice or practitioner* or physician*)).ti,ab.
6. (general adj3 (practice or practitioner* or physician*)).ti,ab.
7. (primary adj3 (care or healthcare)).ti,ab.
8. practice nurs*.ti,ab.
9. (community adj2 nurs*).ti,ab.
10. 1 or 2 or 3 or 4 or 5 or 6 or 7 or 8 or 9
11. Management Quality Circles/
12. quality circle*.ti,ab.
13. (group* adj3 (learning or work* or teaching or education*)).ti,ab.
14. (group* adj2 (intervention* or strateg* or program* or review*)).ti,ab.
15. (quality improvement* adj3 (intervention* or strateg* or program* or initiative* or tool*)).ti,ab.

16. (audit adj3 feedback).ti,ab.

17. peer review*.ti,ab.

18. reflective practice.ti,ab.

19. (learning adj3 (intervention* or strateg* or program* or initiative*)).ti,ab.

20. (education* adj3 (intervention* or strateg* or program* or initiative*)).ti,ab.

21. (continuing adj2 (education or development)).ti,ab.

22. Peer Review, Health Care/

23. medical audit/ or nursing audit/

24. exp Education, Continuing/

25. 11 or 12 or 13 or 14 or 15 or 16 or 17 or 18 or 19 or 20 or 21 or 22 or 23 or 24

TERMS for QUALITY IMPROVEMENT

26. Quality Assurance, Health Care/

27. Total Quality Management/

28. Quality Improvement/

29. "Quality of Health Care"/

30. evidence-based practice/ or evidence-based medicine/ or evidence-based nursing/

31. Physician's Practice Patterns/

32. exp Professional Competence/

33. Guideline Adherence/

34. (quality adj3 (improv* or assurance or change)).ti,ab.

35. (practice adj3 (improv* or change)).ti,ab.

36. ((care or healthcare) adj3 (improv* or change)).ti,ab.

37. ((professional or physician* or medical or clinical or nurs*) adj competenc*).ti,ab.

38. ((guideline* or guidance or standard* or protocol*) adj2 (adhere* or complian* or concord* or implement*)).ti,ab.

39. (evidence based adj2 (practice or prescrib*)).ti,ab.

40. 26 or 27 or 28 or 29 or 30 or 31 or 32 or 33 or 34 or 35 or 36 or 37 or 38 or 39

41. Peer Groups/

42. Group Process/

43. Group Practice/

44. practice based.ti,ab.

45. 41 or 42 or 43 or 44

ADDITIONAL GROUP TERM

46. facilitator.ti,ab.

GROUP TERMS IN PRIMARY CARE

47. 10 and 46

PRIMARY CARE **AND** PROGRAM TERMS **AND** QUALITY IMPROVEMENT TERMS **AND** GROUP TERMS

48. 10 and 25 and 40 and 45

ADDING THE "QUALITY CIRCLES" **AND** "GROUP FACILITATION" IN TITEL **AND** ABSTRACT

49. 12 or 47 or 48

50. limit 49 to yr="1980 -Current"

Appendix 4.6 Selection of papers

Selection Tool						
1.	***"Setting":***	*General practice /Family medicine /Primary healthcare related Group*				
		(Primary healthcare related Group ambulatory Psychiatry, Physiotherapy, Occupational Therapy, Midwifery)				
	Question :	Is the paper about family practice/general practice/			yes	
		primary healthcare related groups?			no	
2.	***"Programme"*** :	*Quality Circle /Peer Review Group /Small group work /Facilitator*				
Question:	Is the paper about structured small group work					
		(group 6 – 12 people who meet at regular intervals) including or not including a facilitator?				
					yes	
					no	
4.	***"Evaluation"***	*Any change in behaviour*		*demonstrated by change*		
		Any change in work practice		*in performance indicators*		
		Any improvement of the outcome				
		From any perspective in primary healthcare				
Question:	Does the paper give information about evaluation?				yes	
					no	
		paper is selected if all main questions are answered with "yes"			yes	
					no	
		further discussion if 1 is yes but 2 unsure				
	date			assessors initials		

Appendix 4.7 Data extraction

	Author, Year	Country	Study design:	setting	Number in group, professional backgrounds	QC Frequency
Data Extraction	Frich 2010	Norway	RCT on Safer Prescription habits for elderly patients OR to improve prescribing of antibiotics with Respiratory Tract Infection; Qualitative study to explore experiences with academic detailing after the trial (participants and tutors)	Primary healthare with 454 GPs in 80 CME groups. This study is a qualitative analysis of two RCTs: The focus grop was on three meetings with the CME groups. Focus groups consisted of 39 GPs and 20 Tutors who also were GPs; 9 focus groups: interviews with tutors and GPs seperately.	39 GPs and 20 Tutors who also were GPs; 9 focus groups	One CME group meeting for prsentation of recommendations, one day workshop to learn more about the recommendations, one CME groupmeeting fo discussion of indiviual reports in the group and one meeting for feedback report. Focus groups 1x at different times of the study: afer the 1st meeting, Tutors had their focus groups after the 2nd and 5 Focus groups after the 3rd meeting. In the end, there was another meeting of all tutors

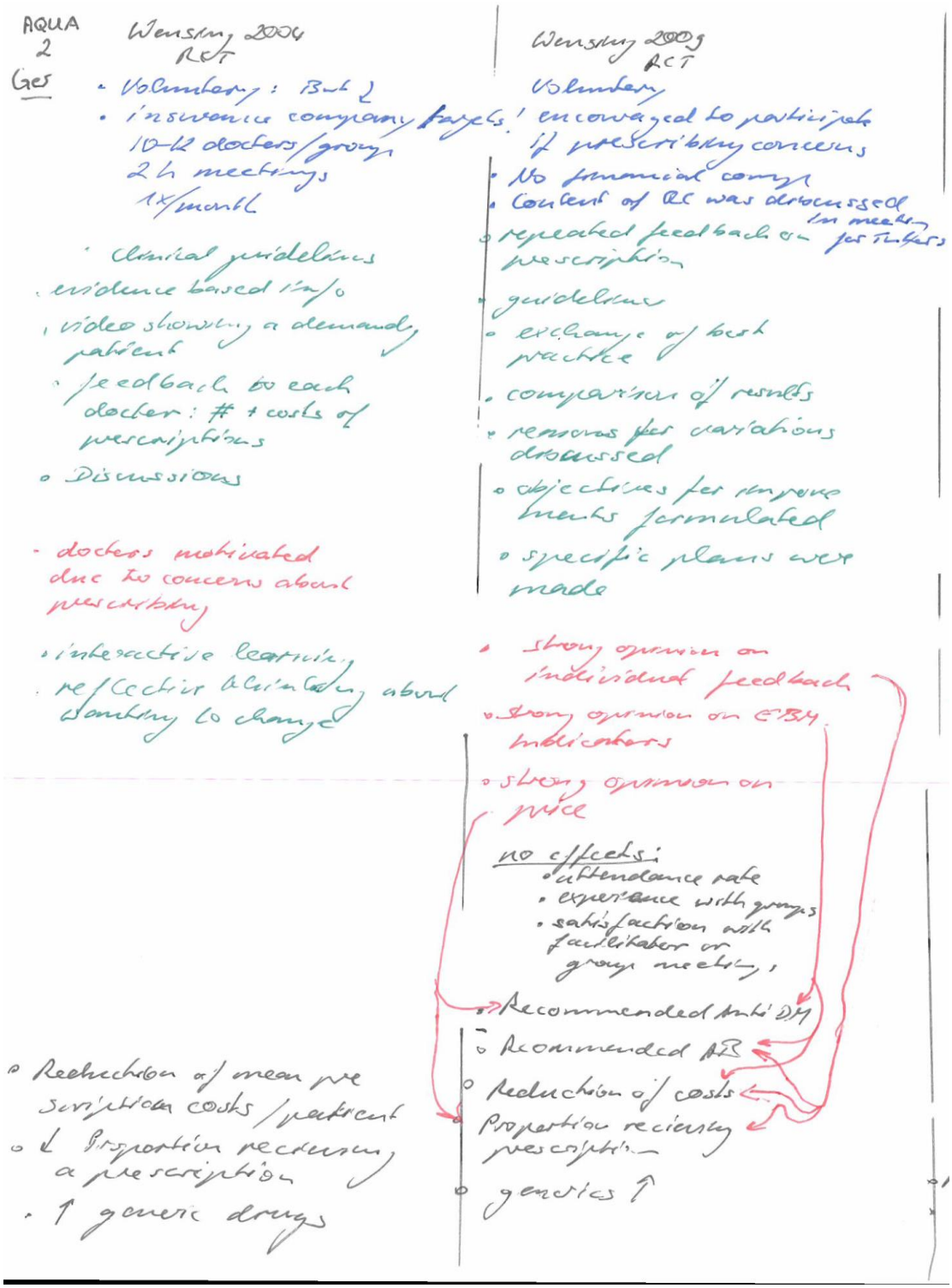
Participation, voluntary, mandatory	Financial compensation, link to mandatory	Group dynamics	Didactic and QI technique		Facilitator's role -characteristics	Facilitator skills, training - characteristics
CME group memebers earned CME points to renew their speciality. GPs were approached throught the CME group leader, Tutors directly.		established CME groups: The groups were different ... we thought that a group is a group and all we have to do is to run the scheme ...and then I experienced that groups have their own cultures. These groups have existed for a while, which we probably have to consider in a programme like this.	1st meeting: tutors present recommendations. One day workshop on recommendations. 2nd meeting: individual reports were discussed in the CME group. 3rd meeting new individual feedback report was discussed in the group.	Academic detailing, feedback in the group, reflective thinking	Tutors percieved themselbes as one of the group	3 days training

Profession of facilitator characteristics	Autonomy of re process	Autonomy re issue choice,	Written summary, minutes - charcteristics	use of existing group	QC purpose characteristics	Evaluation purpose - characteristics	Evaluation tool - charcteristics	Outcome, results	Mechanisms
GP	steered by research process	steered by research process		use of existing group	to improve prescription habits (respiratory tract infections OR to reduce inappropriate prescriptions for elderly	to investigate expereinces of GPs recieving academic detailing in groups and describe expriences tutors have leading such groups	Focus groups	Reflective thinking increased among GPs; they were able to reflect their individual prescription habits in the CME group. Inappropriate results cold put some GPs in distress in fromt of the group. Inappropriate prescribing was linked to the patient, the GP, to the practice, other health care professionals and institutions. Findings suggest that patients' expectations and doctor patient relation influences decisions - it is a balancing of various interests and concerns.	Feedback on their prescription habits motivated the GPs to reflect. .....good atmosphere and sens of security were important for this. Shairng experience of being a GP helped the process: GPS dared discussiong their prescribing patterns

Appendix 4.8 Search for theories in the articles

Theory reporting			Theory Fidelity			
theory of change (introduction) what ought to work. E for explicitly stated, I for implplicitly stated. Paste and copy text bits	What ought to change (methods). E for explicitly stated, I for implplicitly stated. Paste and copy text bits	What did actually work (Discussion). E for explicitly stated, I for implplicitly stated. Paste and copy text bits	Was the theory (of change) used to design for the intervention?	Was the intervention delivered according to the theory?	Were deviations from the original theory noted and explained?	Were the results analysed according to the original or refined theory?
E: external audit allows doctors to review and critically analyse aspects of their clinical performance. Academic detailing involves educational outreach visits and incorporates external audit and supervision, and has a larger effect on prescribing than dissemination of educational materials, audit or feedback alone.....in addi- tion to educational outreach visits by peer tutors in CME groups. IF - Both tutors and GPs emphasised that a "good atmosphere" in the group, and "a sense of security" among group members THEN an open and constructive discussion.... IF .... feedback on their prescription profile THEN motivated them for reflection, learning, and change. IF....Some GPs experienced disclosing their (bad)prescription profile ....THEN "hits" as frightening. .....reports had caused distress for some GPs. I:	E: prescribing habits	E: Peer group academic detailing was experienced as a sui-table method to learn more about pharmacotherapy, though there were participants who argued that the scheme was time-consuming. The participating GPs experienced the CME group meetings as an important arena for learning. They reported picking up good advice from others and learning practical alternatives to drus taht should not be used. GPs said their prescrip- tion data would not mirror all learning effects:One important outcome for the GPs was an experi-ence of being more reflective in decision-making about prescriptions. Tutors did not consider themselves as "experts" but as "one of them". "good atmosphere" .. "sense of security".E: A shared understanding of the complex decision-making involved in	YES -	YES	No but additional mechanisms were stated:for instance distress of doctors when their inafavorable prescirption was exposed. Tutors must be able to handl such situations. Different existing atmospheres in different CME groups	Yes - acc to the original theory

Appendix 4.9 CMOs in each study



Appendix 4.10 CUREC-approved information and consent sheet

Study Title and Date

Exploring why Quality Circles work in Primary Health Care: a realist approach about how, why and under what circumstances they work MS-IDREC-C1-2015-002

Background and aims of the study

Quality Circles (QCs) are small groups of 6 to 12 professionals from the same background who meet at regular intervals to consider their standard practice. QCs are commonly used in primary health care in Europe to improve the standard of health care over time. They represent a complex social intervention that occurs within a fast-changing society. Numerous controlled trials, reviews and studies have shown small but unpredictable positive effects on behaviour change. Although QCs seem to be effective, it is difficult to understand how the results are achieved and how to generalise them with confidence. This research will examine how configurations of components and contextual features within QCs result in changes in health professionals' behaviour. The objective is to increase the understanding of the active components that lead to improved clinical practice among participants.

Who is organising and funding this research?

The research for this study is being undertaken by Adrian Rohrbasser who is a DPhil (doctoral) student in the Department of Primary Care Health Sciences at the University of Oxford. The project is being supervised by Dr Sharon Mickan, University of Oxford, Department of Primary Health Care Sciences and Dr Janet Harris, University of Sheffield, School of Health and Related Research (ScHARR). Both are experienced scientists in knowledge translation and in health care. This research is being done without any funding and has been reviewed and approved by the University of Oxford Central University Research Ethics Committee (CUREC).

Why have I been asked to participate?

You as a stakeholder are important in the evaluation of QCs and are invited to actively take part in this research. You are a general practitioner or administrator and either a participant in QCs, a facilitator, tutor or representative of a professional body, network providing primary health care or a representative of a health insurance company. You are receiving this leaflet as additional information after a telephone conversation with the researcher.

What will taking part in the study involve?

The researcher will contact you once more to clarify questions and give you an opportunity to discuss participation and its consequences. If you agree to participation, he will make an appointment with you. At the meeting, you will be asked to sign a consent form. You will meet the researcher for an informal interview and discussion in the near future and again after a period of about one year. The meeting will take about an hour and a half.

The researcher will record the interview and may also take some notes. Before the researcher starts the interview and discussion, please feel free to ask questions that may have arisen in the meantime. You may withdraw from the study at any time, without any consequences, by advising the researcher of your decision.

What will happen in the study?

Firstly, you are invited to help formulate the research questions and inform the researcher about possible underlying and competing theories that make QCs work. It will take about an hour to talk about who is involved and what actually happens in QCs, when and where they take place, why they are organised and whether and how you think they work.

Secondly, in a later stage, you are invited to participate in the analysis of the results. The researcher will present you with literature findings on QCs and ask you whether they are in line with your experience or not. He will ask your opinion on different propositional statements found in the literature that explain how, why and for whom they work and under what circumstances. Both steps are significant and add relevance and credibility to this type of research.

What are the possible benefits of taking part?

You contribute with your knowledge and experience to the interpretation of the literature findings. Iterative consultations with you will keep the research focussed on the relevant questions. You can also participate in the interpretation of the results. You may disseminate the findings among your colleagues and make use of the findings to improve practice.

What are the possible disadvantages and risks of taking part?

We hope that the experience of taking part in this study will be enjoyable for you. However, there is always the possibility with work that looks at professional experiences that some upsetting memories may be recalled or talked about. You will at no point be obliged to talk about any topic that makes you uncomfortable.

How will my interview be used?

The interviews collected in this study will be used alongside other data sources to uncover more knowledge about QCs. Publications which result from this project may use quotations from your interview. Once the interviews have been deposited at the end of the project, future researchers

may also wish to use and quote your interview in their work. In all works produced using your interview, your name and other personal information will be anonymised.

What happens to the interviews collected during the study?

Interviews will be transcribed and stored digitally, and managed by the researcher, Adrian Rohrbasser, for the duration of the project. Only the researcher will have access to the interviews and personal information.

What happens at the end of the project?

If you agree to participate in this project, it will become part of the research which will be written up as a thesis. All participants are able to request a summary of the research findings should they wish to by contacting the researcher, Adrian Rohrbasser. On successful submission of the thesis, it will be deposited both in print and online in the University of Oxford, to facilitate its use in future research. The digital online copy of the thesis will be deposited with the Oxford University Research Archive (ORA) and will be published with open access, meaning that it will be available to all internet users. At the end of this project the audio and digital data collected from interviews with participants will be deposited at the UK Data Service for use by future researchers.

What should I do if I have any concerns or complaints?

If you have any concerns about any aspect of this project, please speak to the relevant researcher (Dr Adrian Rohrbasser, telephone number 0041 796036531) or his supervisor, Dr Sharon Mickan telephone number 0061 (0) 423 662944, who will do their best to answer your query. The researcher should acknowledge your concern within 10 working days and give you an indication of how he intends to deal with it. If you are still unhappy or wish to make a formal complaint, please contact the chair of the Research Ethics Committee at the University of Oxford (using the contact details below) who will seek to resolve the matter in an expeditious manner:

Chair, Medical Sciences Inter-Divisional Research Ethics Committee; Email: ethics@medsci.ox.ac.uk; Address: Research Services, University of Oxford, Wellington Square, Oxford OX1 2JD

Researcher: Adrian Rohrbasser, Department of Primary Care Health Sciences in Oxford

Work: Santémed Gesundheitszentrum Wil, Friedtalweg 18, 9500 Switzerland, 0041 719135400,

E-mail: adrian.rohrbasser@medbase.ch

CONSENT SHEET

STUDY TITLE: ***Exploring why Quality Circles work in Primary Health Care: a realist approach about how, why and under what circumstances they work MS-IDREC-C1-2015-002***

PURPOSE OF STUDY: This research will examine how configurations of components and contextual features within QCs result in changes in health professionals' behaviour. The objective is to increase the understanding of the active components that lead to improved clinical practice among participants.

We appreciate your interest in participating in this research! Please read through these terms before agreeing to participate.

Please tick the appropriate boxes	**Yes**	**No**
Taking Part		
I have read and understood the research information sheet dated 06/01/2015.	☐	☐
I have been given the opportunity to ask questions about the project and have received satisfactory answers.	☐	☐
I agree to take part in the project and understand that doing so will include being interviewed and audio recorded.	☐	☐
I understand that my taking part is voluntary; I can withdraw from the study at any time and I do not have to give any reasons for why I no longer wish to take part.	☐	☐
I understand how I can raise concerns and make a complaint if necessary.	☐	☐
I am aware that the project has been reviewed and has received ethics clearance through the University of Oxford Central University Research Ethics Committee.	☐	☐
Use of the information which I am providing for this project only		
I understand that the data will be included in a student dissertation	☐	☐
I understand my personal details such as phone number and address will not be revealed to people outside the project.	☐	☐
I understand that my responses may be quoted in publications, reports, web pages and other research outputs.	☐	☐
*Please choose **one** of the following two options:*		
I would like my real name to be used in the above	☐	
I would **not** like my real name to be used in the above.	☐	
Further use of the information provided by me beyond this project		
I agree to the data I provide being archived at the UK Data Archive.[1]	☐	☐

I understand that other genuine researchers will have access to this data only if they agree to preserve the confidentiality of the information as requested in this form. ☐ ☐

I understand that other genuine researchers may use my responses in publications, reports, web pages and other research outputs, only if they agree to preserve the confidentiality of the information as requested in this form. ☐ ☐

Appendix 4.11 Programme description for interviews in phase III

Resultate der Literatur

1 Beginn von QZ:
Ohne Hilfe von aussen führt intrinsische Motivation Gedanken und Erfahrungen auszutauschen zum ersten Gruppentreffen und Entwicklung zu einem QZ.

CME Punkte erleichtern diesen Prozess

Wenn organisatorische und professionelle Autonomie, *= dezentral organisiert (lokale Entscheide werden akzeptiert) und in einer flexiblen Organisation (die Struktur der Organisation passt sich an von QZ gewünschte Veränderungen an)* besteht, werden Ärzte Teil eines Netzwerkes und stimmen der Vorgabe an QZ teilzunehmen zu. Sie treffen sich zu einem **Informationsmeeting**. Die Organisation ist flexibel und dezentral.

Kleinere bis mässige Geldwerte helfen den Prozess beschleunigen

CME Punkte erleichtern diesen Prozess

2 Einführung von QZ
Mit logistischer und praktischer Unterstützung wird das Modell unterstützt und muss erklärt werden in seiner Sinnhaftigkeit. Der Moderator wird eingeführt als gleicher unter gleichen. So kann der **QZ eingeführt** werden und resultiert in hoher Motivation QZ durchzuführen.

3 Gruppe entwickelt sich
Gruppenentwicklung ist wichtig für den weiteren Verlauf der QZ: Eckpunkte wie Zeit, Dauer und Aufgabenteilung werden bestimmt. Normen wie Respekt, Feedback und Kommunikation werden diskutiert. Das sind Voraussetzung für Vertrauen und Sicherheit als Basis für offene Kommunikation

4 weiterer Verlauf
Ohne organisatorische Barrieren und ohne exzessive Ansprüche treffen sich die QZ Mitglieder während 1 ½ bis 2 Stunden, während deren sie nicht gestört werden. Diese Stunden sollten keinen Einfluss auf die Arbeitsintensität des restlichen Tages haben.

Die Gruppe arrangiert sich in einem Kreis ohne Hindernisse. Der Moderator eröffnet die Diskussion, klärt Aussagen und fasst zusammen.

Appendix 4.12 Question sheet used for the focus groups in phase III

Conference Workshop

Quality Circles: what works for whom and why / Adrian Rohrbasser/Sharon Mickan /Janet Harris

I. Read the summary statements

II. Think about your own groups while considering the statements

III. Consider the ones that are different in your group

IV. Add your comments to the statements

1) Statement

If an invitation to a meeting with general information on QCs addressing GP needs is issued and a facilitator, preferably a GP, introduces QCs and explains how they work

then the meeting takes place and people become familiar with the theoretical background of the QC model

provided that the venue is close to the working place and time convenient and/or CME points are offered.

Agree ☐

Disagree ☐ Why? Please explain below:

2) Statement

If a GP, as part of the team, is introduced into the group as a facilitator, then QCs are more relevant to the participants and a sense of ownership is created provided that the GP has completed 2 days' training in facilitating structured small group work

Agree ☐

Disagree ☐ Why? Please explain below:

3) Statement

If objectives, both for the team as a whole and for individual team members are discussed, including the venue, duration and frequency of meetings, as well as individual tasks, such as writing the minutes

then the group forms and develops a basic level of trust

provided that the facilitator introduces people to each other, opens discussions, clarifies and summarizes statements in a group arranged in a circle without barriers, such as screens.

Additional context features: professional and administrative autonomy are needed as well as rooms and equipment.

Agree ☐

Disagree ☐ Why? Please explain below:

4) Statement

If social norms are discussed, for instance punctuality and how people interact with each other

and if further tasks within the group are talked over

then group bonding develops and the level of trust increases

provided that professional and organisational autonomy are granted

Agree ☐

Disagree ☐ Why? Please explain below:

5) Statement

If people can present their clinical cases and share their experiences

then people will be satisfied with the group process

provided that the facilitator ensures interactive responses and respects each member's contributions.

Additional context features: organizational barriers and excessive demands for the meetings have to be avoided.

Protected time is offered: the meeting takes place during working hours and participants are freed from clinical duties during the sessions.

Agree ☐

Disagree ☐ Why? Please explain below:

6) Statement

If the group discusses case reports and experiences

then people will participate actively and relate to the group

provided that the facilitator elicits open communication

Agree ☐

Disagree ☐ Why? Please explain below:

7) Statement

If the group discusses difficult experiences that burden participants

then others will appreciate their professional role and group identity increases

provided that confidentiality is guaranteed within the group and granted even at an organizational level

Agree ☐

Disagree ☐ Why? Please explain below:

8) Statement

If clinical cases are presented and different opinions discussed

then interactive learning and personal reflection on action take place

provided that the facilitator involves all QC members with an appropriate balance between comfort and challenge, depending on what level of trust the group has reached.

Agree ☐

Disagree ☐ Why? Please explain below:

9) Statement

If the group contemplates clinical cases and mirrors their practice by looking at diagnostic patterns or prescription habits and discusses emerging topics in the light of evidence-based information

And/Or

If the group reflects on video consultations or results of patient satisfaction surveys

And/Or

If the group meets up with a local opinion leader and reflects on clinical scenarios

then people increase their understanding and gain insight into gaps in knowledge

provided that the facilitator establishes and maintains a learning environment and acts cautiously when addressing performance.

Additional context features: the management supports QCs to improve performance by allowing autonomy while setting expectations. Access to scientific knowledge, practice guidelines, quality indicators, a performance management system and an electronic medical record are provided to mirror current practice.

Agree ☐

Disagree ☐ Why? Please explain below:

10) Statement

If the facilitator uses different techniques to reflect practice, such as brain-storming, followed by contentious discussions and reaching a consensus, professional reprocessing of patient situations and role play, raising awareness of emotions, and purposeful use of local experts

then new knowledge is created

provided that the management accepts that acknowledging unstated beliefs about innovations is essential for creating new knowledge.

Additional context features: the management values QC contributions to the organization. Local adjustments of knowhow are allowed in order to customize knowledge and organizational pluralism is accepted.

Agree ☐

Disagree ☐ Why? Please explain below:

11) Statement

If participants in the group compare their experiences and current practice with each other and with evidence-based information using different facilitating techniques like contentious discussion and reaching a consensus

then new knowledge is validated and corroborated

provided that the management agrees on shared decisions when it comes to the use of new knowledge and accepts a certain degree of diversity in the organization.

Agree ☐

Disagree ☐ Why? Please explain below:

12) Statement

If the facilitator helps the group or the individual to make a binding plan of what they want to change in the light of new knowledge

then participants make a commitment to change

provided that the management agrees on shared decisions when it comes to the use of that new knowledge.

Agree ☐

Disagree ☐ Why? Please explain below:

13) Statement

If the group discusses factors that hinder or foster implementation of new knowledge or change of practice and carefully evaluates adjustments to local conditions

then people use that new knowledge at their working place

provided that the management supports social processes that form and circulate knowledge and accepts a certain degree of diversity in the organization

Agree ☐

Disagree ☐ Why? Please explain below:

14) Statement

If the group compiles detailed information about how to follow progressive goals and continuously evaluate new knowledge

then new knowledge is systematically used and evaluated in the working place

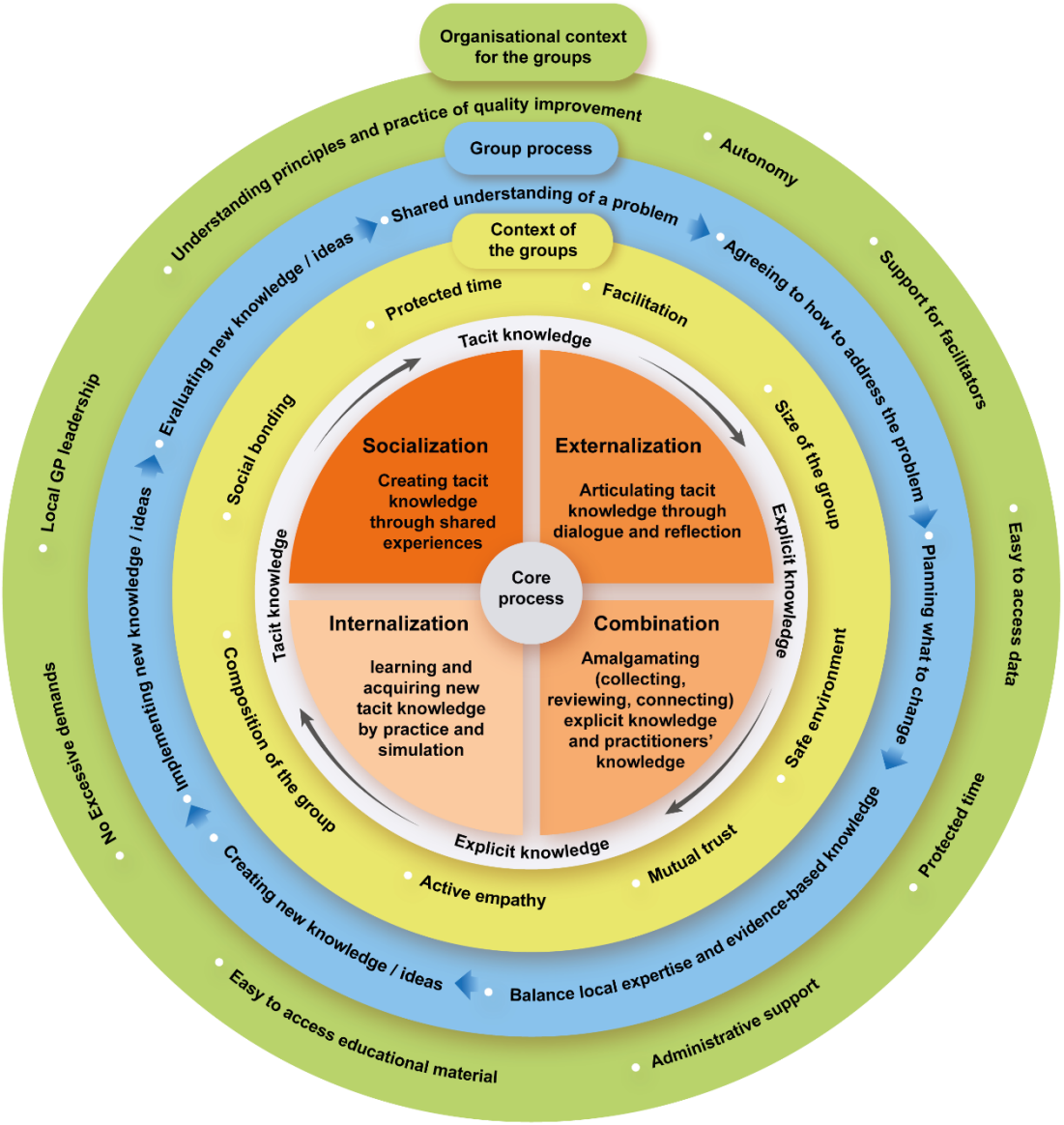
provided that the management supports social processes that form and circulate knowledge and assists in carrying out the tasks

Agree ☐

Disagree ☐ Why? Please explain below:

Appendix 4.12 Material that participants received in advance

Infographic on contextual layers



Programme Theory in text form

Read the summary statements

I. Think about your own groups while considering the statements, why it may work - or not
II. Consider the ones that are different in your group
III. Give your comments to the statements during the interview

If an invitation to a meeting with general information on QC addressing GP needs is issued and a facilitator, preferably a GP, introduces QCs and explains how they work

then the meeting takes place and people become familiar with the theoretical background of the QC model

provided that the venue is close to the working place and time convenient and/or CME Points are offered.

If a GP, as part of the team, is introduced into the group as a facilitator

then QC is more relevant to the participants and a sense of ownership is created

provided that the GP has completed (2 days') training in facilitating structured small group work

If objectives, both for the team as a whole and for individual team members are discussed, including the venue, duration and frequency of meetings, as well as individual tasks, such as writing the minutes

then the group forms and develops a basic level of trust

provided that the facilitator introduces people to each other, opens discussions, clarifies and summarizes statements in a group **arranged** in a circle without barriers, such as screens.

Additional context features: professional and administrative autonomy are needed as well as rooms and equipment.

If social norms are discussed, for instance punctuality and how people interact with each other

and if further tasks within the group are talked over

then group bonding develops and the level of trust increases

provided that professional and organisational autonomy are granted

If people can present their clinical cases and share their experiences

then people will be satisfied with the group process

provided that the facilitator ensures interactive responses and respects each member's contributions.

Additional context features: organizational barriers and excessive demands for the meetings have to be avoided.

Protected time is offered: the meeting takes place during working hours and participants are freed from clinical duties during the sessions.

If the group discusses case reports and experiences

then people will participate actively and relate to the group

provided that the facilitator elicits open communication

If the group discusses difficult experiences that burden participants

then others will appreciate their professional role and group identity increases

provided that confidentiality is guaranteed within the group and granted even at an organizational level

If clinical cases are presented and different opinions discussed

then interactive learning and personal reflection on action take place

provided that the facilitator involves all group members with an appropriate balance between comfort and challenge, depending on what level of trust the group has reached.

If the group contemplates clinical cases and mirrors their practice by looking at diagnostic patterns or prescription habits and discusses emerging topics in the light of evidence-based information

And/Or

If the group reflects on video consultations or results of patient satisfaction surveys

And/Or

If the group meets up with a local opinion leader and reflects on clinical scenarios

then people increase their understanding and gain insight into gaps in knowledge

provided that the facilitator establishes and maintains a learning environment and acts cautiously when addressing performance.

Additional context features: the management supports QC to improve performance by allowing autonomy while setting expectations. Access to scientific knowledge, practice guidelines, quality indicators, a performance management system and an electronic medical record are provided to mirror current practice.

If the facilitator uses different techniques to reflect practice, such as brain-storming, followed by contentious discussions and reaching a consensus, professional reprocessing of patient situations and role play, raising awareness of emotions, and purposeful use of local experts

then new knowledge is created

provided that the management accepts that acknowledging unstated beliefs about innovations is essential for creating new knowledge.

Additional context features: the management values the groups' contributions to the organization. Local adjustments of knowhow are allowed in order to customize knowledge and organizational pluralism is accepted.

If participants in the group compare their experiences and current practice with each other and with evidence-based information using different facilitating techniques like contentious discussion and reaching a consensus

then new knowledge is validated and corroborated

provided that the management agrees on shared decisions when it comes to the use of new knowledge and accepts a certain degree of diversity in the organization.

If the facilitator helps the group or the individual to make a binding plan of what they want to change in the light of new knowledge

then participants make a commitment to change

provided that the management agrees on shared decisions when it comes to the use of that new knowledge.

If the group discusses factors that hinder or foster implementation of new knowledge or change of practice and carefully evaluates adjustments to local conditions

then people use that new knowledge at their working place

provided that the management supports social processes that form and circulate knowledge and accepts a certain degree of diversity in the organization

If the group compiles detailed information about how to follow progressive goals and continuously evaluate new knowledge

then new knowledge is systematically used and evaluated in the working place

provided that the management supports social processes that form and circulate knowledge and assists in carrying out the tasks

Appendix 4.13 Catalogue of questions in Phase IV

These questions guided the interviews. They are not explicitly posed to each participant. Emphasis will be put on personal experiences and examples, in this case especially on the current challenges, to reveal more data on the level of the official body and the institutional level affect QC. Any documentation of these examples is collected and added as data.

1. ***Introductory Questions***

a. Tell me how QCs came about in your country and how they spread?

b. Can you describe a typical QC for me – how does it work?

2. ***Questions concerning the level of official bodies:***

   a. Does QC has **political backing**?

   b. Is there **structural or financial support** for QC?

   c. Is there **public support** for QC?

      Do you think this is important? And if you do think so – why?

      How and why do you think this works in your country?

   d. Do you get **CME credits** as an official acknowledgement? – Why may this be important?

3. ***Questions concerning the Institutional setting***

   a. Do you have an **organisational level** for your QC?

      What do they do and why?

      Why do you think this is important?

      How does it affect the group work?

      Probing questions concerning details

   b. Autonomy

   Do you have organisational a/professional autonomy?

      Why is this important?

      Does your organisation accept local adjustments and therefore pluralism?

      Why is this important?

      How is the balance between autonomy and stimulation to improve practice?

   c. Are there **demands**?

      How does it affect the group?

   d. Is there **protected time** for QC?

Why is this important?

e. Do you have **access** to:

Scientific knowledge / praxis mirrors, quality indicators / clinical practice guidelines?

Do you think this is important? Why?

f. Training:

Does your organisation provide training in QI tools?

Does your organisation provide training for facilitators?

4. ***Questions: concerning the programme theory*** *(INFORMATION about the programme theory was sent to participants in advance)*

I. What is your experience with case discussions – what happens in the group?

a. Why do you think this happens?

b. What contextual factors are of importance?

i. Group level – probing questions: *enabling contextual features/individual barriers*

ii. Organizational level – probing questions: *supporting contextual features*

c. Offering reasoning: do you have any idea why this happens?

II. What happens if you share difficult moments from your professional life?

a. Why do you think this happens?

b. What contextual factors are of importance?

i. Group level – probing questions: enabling contextual features individual barriers

ii. Organizational level – probing questions: supporting contextual features

c. Offering reasoning: do you have any idea why this happens?

III. How do you deal with personal responses to actions – like when a colleague criticises your way of working – does it happen?

a. Why do you think this happens? Why do you deal with it the way you just described?
b. What contextual factors are of importance?
    i. Group level – probing questions: enabling contextual feature/individual barriers
    ii. Organizational level – probing questions: supporting contextual features
c. Offering reasoning: do you have any idea why this happens?
   What do you think happens in a group if you mirror practice performance?
d. For the individual – benchmarking?
e. For the whole group?
f. Why do you think this happens (a and b)?
g. What contextual factors are of importance?
    i. Group level – probing questions: enabling contextual feature/individual barriers
    ii. Organizational level – probing questions: supporting contextual features
h. Offering reasoning: do you have any idea why this happens?

IV. Do you compare your ways of working with each other and how things should be done? For instance, guidelines as proposed in EBM material?

a. What happens in the group?
b. Why do you think this happens?
c. What contextual factors are of importance?
    i. Group level – probing questions: enabling contextual features/individual barriers
    ii. Organizational level – probing questions: supporting contextual features
d. Offering reasoning: do you have any idea why this happens?

V. When you introduce something new in your meetings - how do you do that?

   a. Why do you do it that that way?

   b. What contextual factors are of importance?

      i. Group level – probing questions: enabling contextual features/individual barriers

      ii. Organizational level – probing questions: supporting contextual features

   c. Offering reasoning: do you have any idea why this happens?

VI. When you want an innovation to be used routinely, what do you do? Do you have an example?

   a. Why would you do it that way?

   b. What contextual factors are of importance?

      i. Group level – probing questions: enabling contextual features/individual barriers

      ii. Organizational level – probing questions: supporting contextual features

   c. Offering reasoning: do you have any idea why this happens?

VII. Do you have any experience with health care professionals other than doctors in QCs?

   a. Are there differences to GPs participating in QCs? Can you imagine why?

   b. Do you have inter-professional QCs?

      i. Differences to QCs among GPs?

      ii. What does this kind of QC add?

      iii. Are there possible obstacles?

   c. Offering reasoning: do you have any idea why this happens?

5. <u>Questions concerning the current challenges</u>

   a. How do you think the current challenges affect the CME groups?
   b. Probing Q: at the wider level / at the organisational level / at the group level

Parts of the programme theory that serve as questions

The parts of the programme theory that have been used to develop the interview questions. Due to limited space, the contextual features are added below.

Process in the group	**Actions Taken**	**Mechanisms (Examples)**
Shared understanding of a problem	Exchanging experiences: presentations of own clinical cases followed by case discussions.	Feeling actively involved, having a sense of ownership and sense of affiliation to the group. Level of trust increases.
Sharing knowledge	Exchange of difficult experiences and exchange of emotional responses.	Mutual understanding increases, relevant practical knowledge is discussed.
Reflection on action	Discussion of personal responses on actions in a safe environment.	Previous knowledge is activated. The group supports exploratory behaviour.
Identifying gaps of knowledge and quality improvement issues	Comparing diagnostic habits or prescription patterns OR other means of mirroring practice routines.	Critical reflection on experience and identification of learning needs or necessary changes.
Justifying new concepts	Comparing and contrasting practitioner-based knowledge and evidence-based knowledge.	Feeling of competency and empowerment through the process.
Testing new knowledge	Identification of barriers and obstacles.	Intentions lead to increased effort to perform the behaviour (Theory of Reasoned Action). Feeling of empowerment by the process.
Systematic use	Practitioners use new knowledge and skills to improve practice	Newly developed skills are important to people. Feeling of being in control and empowered by the process
Enabling Context	**Description of contextual features**	
Mutual trust	Trust within the group and trust between the management and the group.	
Active empathy	QC members must care about their colleagues when they question observations.	

Access to help	Financial resources, library resources, administrative and didactic support. Create and accept social processes that support the circulation of knowledge, such as meetings, social events.
Leniency in judgement	Management should value knowledge from QCs that can improve performance and also value the fact that QCs may resolve emerging problems. No excessive demands.
Courage	Accept local adjustments and tacit beliefs in order to make them explicit. Balance between autonomy and the urge to stimulate, to improve performance. Value and trust knowledge that arises in QCs.
Support of the group	**Description of supporting contexts**
Facilitation	Opens discussions, clarifies statements, summarizes, elicits interactive responses. They respect each member's contributions and keep an appropriate balance between challenge and comfort. Facilitators create a safe environment where no one gets hurt, where it is possible to communicate openly. They establish and maintain a learning environment.
Size of the group	Groups exceeding 12-15 people become inefficient and groups smaller than 4 do not have the same exchange of thoughts.
Composition of the group	Should share common interests and the same concerns. They should be able to relate to each other's problems.

Safe environment	Management should value knowledge from QCs that can improve performance and also value the fact that QCs may resolve emerging problems. No excessive demands.
Protected time	Should be considered as working time, no other duties, no disadvantages.
Individual barriers	**Description of individual barriers**
Limited accommodation	New knowledge has to be assimilated with pre-existing experiences. This process can be challenging if radically new situations arise in the form of new knowledge that cannot become part of justified individual beliefs.
Threat to self-image	Breaking away from habits may feel threatening.
Variety in the group	Variety in the group; the very source for creativity may turn into a threat if individual positions are too remote from each other.
Personal withdrawal	Facilitators have to be very observant about people who drop out and withdraw.

Appendices Chapter Six – results Phase I

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Appendix 6.1 Background papers of the scoping review

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Appendix 6.2 Papers examining quality circles

Non-randomised controlled studies

Dyrkorn, **R.**, **et al. (2016)**. "Peer academic detailing on use of antibiotics in acute respiratory tract infections. A controlled study in an urban Norwegian out-of-hours service." Scandinavian Journal of Primary Health Care 34(2): 180-185.

Using trained GPs to give peer academic detailing to colleagues in combination with open discussion on prescription, showed a significant change in prescription of antibiotics towards national guidelines. Key points Phenoxymethylpenicillin is the first choice for the most of respiratory tract infections when indicated. Despite the guidelines for the choice of antibiotics in Norway, general practitioners' choice often differs from these. We showed that a session of three times 45min of peer academic detailing changed significantly the choice of antibiotics towards the National Guidelines in an urban Norwegian out-of-hours service.

Elward, **K.**, **et al. (2014)**. "Improving quality of care and guideline adherence for asthma through a group self-assessment module." Journal of the American Board of Family Medicine 27(3): 391-398.

Group Self-Assessment Module activities may be an effective method to increase physicians' knowledge of and adherence to clinical guidelines.

Hartmann, **P.**, **et al. (1995)**. "Structured public health quality circle on the topic of diabetes management in general practice. [German] Strukturierte kassenarztliche Qualitatszirkel zum Thema Diabetikerbetreuung in der Praxis." Zeitschrift für ärztliche Fortbildung 89(4): 415-418.

The participation in a quality circle resulted in a significant and relevant improvement of the quality concerning the detection of diabetes related complications.

Ioannidis, **G.**, **et al. (2007)** Canadian Quality Circle pilot project in osteoporosis: rationale, methods, and feasibility. Canadian family physician Médecin de famille canadien 1694-1700

Findings from the pilot study showed that the Canadian Quality Circle project was well designed and well received. Use of QCs appeared to be feasible for transferring knowledge and giving physicians an opportunity to analyze work-related problems and develop solutions to them.

Ioannidis, **G.**, **et al. (2009).** "The utilization of appropriate osteoporosis medications improves following a multifaceted educational intervention: the Canadian quality circle project (CQC)." BMC Medical Education 9: 54.

QCs methodology was successful in increasing physicians' appropriate use of osteoporosis medications in accordance with Osteoporosis Canada guidelines.

Mahlknecht, **A.**, **et al. (2016).** "Improving quality of care in general practices by self-audit, benchmarking and quality circles." Wien Klin Wochenschr 128(19-20): 706-718.

The intervention was able to improve measured quality of care. Barriers were detected that should be considered in a possible implementation of quality control programs.

Niquille, **A.**, **et al. (2010)**. "The nine-year sustained cost-containment impact of swiss pilot physicians-pharmacists quality circles." Ann Pharmacother 44(4): 650-657.

The physicians-pharmacists quality circles work process has yielded sustainable results, such as significant cost savings, higher penetration of generics and reflection on patient safety, and the place of "new" drugs in therapy. The PPQCs may also constitute a solid basis for implementing more comprehensive collaborative programs, such as medication reviews, adherence-enhancing interventions, or disease management approaches.

Richards, **D.**, **et al. (2003).** "Do clinical practice education groups result in sustained change in GP prescribing?" Family Practice 20(2): 199-206.

The results support a positive effect of the education strategy on prescribing behaviour in the intervention group for most outcomes measured. The effect seen is statistically significant,

sustained and is in addition to any effect of the other pharmaceutical educational initiatives already undertaken by the independent GPs association.

Riou, **F.**, **et al. (2007).** "Results of a 12-month quality-circle prescribing improvement programme for GPs." Br J Gen Pract 57(540): 574-576.

The reduction in drug expenditure exceeded the cost of the programme, although variations in size effects were observed among the settings.

Wensing, **M.**, **et al. (2004).** "Quality circles to improve prescribing patterns in primary medical care: what is their actual impact?" J Eval Clin Pract 10(3): 457-466.

Large-scale application of quality circles had intended effects on prescribing decisions in primary care in Germany. The effects found in this study may reflect better what improvements can be achieved than randomized trials of similar interventions.

Wensing, **M.**, **et al. (2009).** "Quality circles to improve prescribing of primary care physicians. Three comparative studies." Pharmacoepidemiol Drug Saf 18(9): 763-769.

Quality circles had a modest effect on prescribing quality and costs. If widely implemented, they could have nationwide impact on the quality and costs of prescribing in primary care.

Randomised controlled trials

Gjelstad, **S.**, **et al. (2013)**. "Improving antibiotic prescribing in acute respiratory tract infections: cluster randomised trial from Norwegian general practice (prescription peer academic detailing (Rx-PAD) study)." BMJ 347: f4403.

The intervention led to improved antibiotic prescribing for respiratory tract infections in a representative sample of Norwegian general practitioners, and the courses were feasible to the general practitioners.

Goldberg, **H. I.**, **et al. (1998).** "A randomized controlled trial of CQI teams and academic detailing: can they alter compliance with guidelines?" Joint Commission Journal on Quality Improvement 24(3): 130-142.

The academic detailing techniques and the continuous quality improvement teams evaluated were generally ineffective in improving guideline compliance and clinical outcomes regarding the primary care of hypertension and depression.

Jager, **C.**, **et al. (2017)**. "Impact of a tailored program on the implementation of evidence-based recommendations for multimorbid patients with polypharmacy in primary care practices-results of a cluster-randomized controlled trial." Implementation Science 12(1): 8.

The tailored program may improve implementation of medication counselling and brown bag review whereas the use of medication lists and medication reviews did not improve. No effect of the tailored program on the combined primary outcome could be substantiated. Due to limitations of the study, results have to be interpreted carefully. The factors facilitating and hindering successful implementation will be examined in a comprehensive process evaluation.

Lagerlov, **P.**, **et al. (2000)**. "Improving doctors' prescribing behaviour through reflection on guidelines and prescription feedback: a randomised controlled study." Qual Health Care 9(3): 159-165.

Deriving quality criteria of prescribing by discussing guideline recommendations gave the doctors a basis for judging their treatment of individual patients as acceptable or unacceptable. Presented with feedback on their own prescribing, they learned what they did right and wrong. This provided a foundation for improvement and the process thus instigated resulted in the doctors providing better quality patient care.

Rognstad, **S.**, **et al. (2013).** "Prescription peer academic detailing to reduce inappropriate prescribing for older patients: a cluster randomised controlled trial." Br J Gen Pract 63(613): e554-562.

Educational outreach visits with feedback and audit, using GPs as academic detailers in GPs' CME groups, reduced PIPs for older patients aged >/=70 years in general practice.

Schneider, **A.**, **et al. (2008).** "Impact of quality circles for improvement of asthma care: results of a randomized controlled trial." J Eval Clin Pract 14(2): 185-190.

Quality circles working with individualized feedback are effective at improving asthma care. The trial may have been underpowered to detect specific benchmarking effects. Further research is necessary to evaluate strategies for improving the self-management of asthma patients.

Verbakel, **N. J.**, **et al. (2015)**. "Effects of patient safety culture interventions on incident reporting in general practice: A cluster randomised trial a cluster randomised trial." British Journal of General Practice 65(634): e319-e329.

Educating staff and facilitating discussion about patient safety culture in their own practice leads to increased reporting of incidents. It is beneficial to invest in a team-wise effort to improve patient safety.

Verstappen, **W. H.**, **et al. (2003)**. "Effect of a practice-based strategy on test ordering performance of primary care physicians: a randomized trial." JAMA 289(18): 2407-2412.

In this study, a practice-based, multifaceted strategy using guidelines, feedback, and social interaction resulted in modest improvements in test ordering by primary care physicians.

Verstappen, **W. H.**, **et al. (2004).** "Improving test ordering in primary care: the added value of a small-group quality improvement strategy compared with classic feedback only." Ann Fam Med 2(6): 569-575.

Compared with only disseminating comparative feedback reports to primary care physicians, the new strategy of involving peer interaction and social influence improved the physicians' test-ordering behavior. To be effective, feedback needs to be integrated in an interactive, educational environment.

Verstappen, **W. H.**, **et al. (2004).** "Comparing cost effects of two quality strategies to improve test ordering in primary care: a randomized trial." Int J Qual Health Care 16(5): 391-398.

On the basis of our findings, including the expected non-monetary benefits, we recommend further long-term effect and cost-effect studies on the implementation of the quality strategy.

Vervloet, **M.**, **et al. (2016).** "Reducing antibiotic prescriptions for respiratory tract infections in family practice: results of a cluster randomized controlled trial evaluating a multifaceted peer-group-based intervention." NPJ Primary Care Respiratory Medicine 26: 15083.

This multifaceted peer-group-based intervention was effective in reducing the number of RTI-related antibiotic prescriptions for adolescents and adults. To affect antibiotic prescribing in children other methods are needed.

Welschen, **I.**, **et al. (2004).** "Effectiveness of a multiple intervention to reduce antibiotic prescribing for respiratory tract symptoms in primary care: randomised controlled trial." BMJ 329(7463): 431.

A multiple intervention reduced prescribing rates of antibiotics for respiratory tract symptoms while maintaining a high degree of satisfaction among patients. Further research should focus on the sustainability and cost effectiveness of this intervention.

Wilcock, **J.**, **et al. (2013).** "Tailored educational intervention for primary care to improve the management of dementia: The EVIDEM-ED cluster randomized controlled trial." Trials 14 (1) (no pagination) (397).

The trial was timely, coinciding with financial incentives for dementia management in general practice (through the Quality Outcomes Framework); legal imperatives (in the form of the Mental Capacity Act 2005); policy pressure (The National Dementia Strategy 2009); and new resources (such as dementia advisors) that increased the salience of dementia for general practitioners. Despite this the intervention did not alter the documentation of clinical management of patients with dementia in volunteer practices, nor did it increase case identification.

Mixed methods study

Ter Brugge, **B. P. H.**, **et al. (2017)**. "The use of evidence during group meetings of Dutch general practitioners." Education for Primary Care 28(6): 307-312.

In the Netherlands, quality circles seem to be more goal-oriented than learning oriented. Learning discussions about controversies in clinical research or about the integration of evidence, patient values and clinical expertise occurred infrequently. To harvest the potential value of group meetings for EBM learning, quality circles in their present design are not optimal.

Qualitative studies

Andres, **E.**, **et al. (2015)**. "20 years of quality circles for family practitioners - Stocktaking and perspectives: A workshop report. [German]." Zeitschrift fur Allgemeinmedizin 91(2): 66-70.

Measures were identified to support and improve QC-work: Among others, structured and evidence-based materials on different QC-topics should be available on demand for QC moderators. Furthermore, a good self-confidence of FPs was identified as fundamental for a fruitful exchange on equal footing between FPs and medical specialists. To further improve and refine QCs a lot of issues still remain to be addressed by all stakeholders involved.

Fisher, **D. M.**, **et al. (2013)**. "Engagement of groups in family medicine board maintenance of certification." Journal of the American Board of Family Medicine: JABFM 26(2): 149-158.

Practice-level collaboration, access to a practice coach, flexibility in choosing and focusing improvement projects, tailored support, and involvement with professional affiliations can enhance the Part IV MOC process. Specialty boards are likely to discover productive opportunities from working with practices, professional organizations, and health care systems to support intra- and interpractice collaborative QI work that uses Part IV Maintenance of Certificatio requirements to motivate practice improvement.

Francois, **P.**, **et al. (2013).** "[Peer groups: a model for the continuous professional development in general practice]." Presse Medicale 42(1): e21-27.

This study showed that peer group activity was growing in Isere. It was widely welcomed by GPs, who wondered in which way those groups could satisfy the obligations of professional development mentioned in the 2009 French law: Hospital, Patient, Health, Territory (HPST).

Frich, **J.**, **et al. (2010)**. "General practitioners and tutors' experiences with peer group academic detailing: a qualitative study." BMC Family Practice 11(1): 12.

GPs and tutors experienced peer group academic detailing as a suitable method to discuss and learn more about pharmacotherapy. An important outcome for GPs was being more reflective about their prescriptions. Disclosure of inappropriate prescribing can cause distress in some doctors, and tutors must be prepared to recognise and manage such reactions.

Gehring, **K.**, **et al. (2013).** "Safety climate and its association with office type and team involvement in primary care." International Journal for Quality in Health Care 25(4): 394-402.

Results indicate that frequent quality circle participation and team meetings involving all team members are effective ways to strengthen safety climate in terms of team-based strategies and activities in error prevention.

Gehring, **S. C.**, **et al. (2017)**. "Structured pharmacotherapy in multimorbid seniors - A pilot project. [German]." Zeitschrift fur Allgemeinmedizin 93(6): 266-270.

The algorithm was feasible to use. To what extent the observed reduction of the number of prescriptions is causally related to the algorithm should be tested within a controlled design.

Jenson, **C. M.**, **et al. (2006)**. "Is small-group education the key to retention of sessional GPs?" Education for Primary Care 17(3): 218-226.

The association between educational support and retention should be studied for other members of the primary care team, health professionals outside general practice and healthcare systems outside the NHS and the UK.

Nielsen, **H. G. and A. S. Davidsen (2017).** "Witnesses in the consultation room - Experiences of peer group supervision." Education for Primary Care 28(5): 258-264.

Participation seemed to improve communication skills and the ability to take a more patient-centred approach. It increased job satisfaction and prevented burnout. A non-judgemental environment, respect and acknowledgement of all participants were important for developing confidence and for supporting personal and professional development.

Overton, **G. K.**, **et al. (2009).** "The Practice-based Small Group Learning programme: experiences of learners in multi-professional groups." J Interprof Care 23(3): 262-272.

The learning process in the groups came close to transformative learning--there were changes in perspectives, acquisition of new knowledge and increased self-esteem. The appropriateness of the PBSGL approach for the CPD of mixed groups of GPs and PNs is discussed.

Roberts, **C. M.**, **et al. (2012).** "A randomized trial of peer review: the UK National Chronic Obstructive Pulmonary Disease Resources and Outcomes Project: three-year evaluation." J Eval Clin Pract 18(3): 599-605.

The findings demonstrate significant change in service provision over 3 years in both control and intervention sites with great variability in both groups. The combined quantitative and

qualitative findings indicate that targeted mutual peer review is associated with improved quality of care, improvements in service delivery and with changes within departments that promote and are precursors to quality improvement.

Sommers, **L. S.**, **et al. (2007).** "Practice inquiry: clinical uncertainty as a focus for small-group learning and practice improvement." J Gen Intern Med 22(2): 246-252.

Ongoing clinician involvement suggests that Practice Inquiry is a feasible, acceptable, and potentially useful set of PBLI methods. Two of the Practice Inquiry's group learning tasks received comparatively less focus: integrating research evidence with clinical experience and tracking dilemma case outcomes. Future work should focus on reducing the methodological limitations of a demonstration effort and examining factors affecting clinician participation. Set-aside work time for clinicians, or other equally potent incentives, will be necessary for the further elaboration of these PBLI methods aimed at managing uncertainty.

Watkins, **C.**, **et al. (2004)**. "Factors affecting feasibility and acceptability of a practice-based educational intervention to support evidence-based prescribing: a qualitative study." Fam Pract 21(6): 661-669.

The study indicates the importance of preparing the practice adequately, including providing protected time for all GPs to attend the educational intervention. Scenarios and the structure of the sessions need to make more explicit the links between everyday practice and published evidence of effectiveness. Emphasis on cost-effectiveness may be counterproductive and wider benefits need to be emphasized. We have also identified the skill profile of the facilitator role. Our study indicates a need for a clearer understanding of GPs' perception of clinical autonomy and how this conflict with the goal of agreement on practice guidelines for treatment. The intervention is now ripe for further development, perhaps by integrating it with other interventions to change professional behaviour. The improved intervention should then be evaluated in a randomized controlled trial.

Arnold, **S. and S. Straus (2005)** Interventions to improve antibiotic prescribing practices in ambulatory care. Cochrane Database of Systematic Reviews DOI: 10.1002/14651858.CD003539.pub2

Multi-faceted interventions where educational interventions occur on many levels may be successfully applied to communities after addressing local barriers to change. These were the only interventions with effect sizes of sufficient magnitude to potentially reduce the incidence of antibiotic-resistant bacteria.

Baker, **R.**, **et al. (2010)** Tailored interventions to overcome identified barriers to change: effects on professional practice and health care outcomes. Cochrane Database of Systematic Reviews DOI: 10.1002/14651858.CD005470.pub2

The findings indicate that tailored interventions can change professional practice. As yet, there is insufficient evidence on the most effective approaches to tailoring, including how barriers should be identified and how interventions should be selected to address the barriers.

Baker, **R.**, **et al. (2015)**. "Tailored interventions to address determinants of practice." Cochrane Database Syst Rev 4: Cd005470.

Tailored implementation can be effective, but the effect is variable and tends to be small to moderate.

Baskerville, **N. B.**, **et al. (2012).** "Systematic Review and Meta-Analysis of Practice Facilitation Within Primary Care Settings." The Annals of Family Medicine 10(1): 63-74.

Practice facilitation has a moderately robust effect on evidence-based guideline adoption within primary care. Implementation fidelity factors, such as tailoring, the number of practices per facilitator, and the intensity of the intervention, have important resource implications.

Bowie, **P.**, **et al. (2008)**. "A review of the current evidence base for significant event analysis." Journal of Evaluation in Clinical Practice 14(4): 520-536.

A chasm exists between the high expectations for SEA and the lack of evidence of its impact. Significant event analysis may have some merit as a team-based educational tool.

Cadogan, **S. L.**, **et al. (2015)**. "The effectiveness of interventions to improve laboratory requesting patterns among primary care physicians: a systematic review." Implement Sci 10: 167.

Interventions such as educational strategies, feedback and changing test order forms may improve the efficient use of laboratory tests in primary care; however, the level of evidence is quite low and the quality is poor. The reproducibility of findings from different laboratories is also difficult to ascertain from the literature.

Davis, **D.**, **et al. (1999)**. "Impact of formal continuing medical education: Do conferences, workshops, rounds, and other traditional continuing education activities change physician behaviour or health care outcomes?" JAMA 282(9): 867-874.

Our data show some evidence that interactive CME sessions that enhance participant activity and provide the opportunity to practice skills can effect change in professional practice and, on occasion, health care outcomes. Based on a small number of well-conducted trials, didactic sessions do not appear to be effective in changing physician performance.

Davis, **D. A.**, **et al. (2006)**. "Accuracy of physician self-assessment compared with observed measures of competence: a systematic review." JAMA 296(9): 1094-1102.

While suboptimal in quality, the preponderance of evidence suggests that physicians have a limited ability to accurately self-assess. The processes currently used to undertake professional development and evaluate competence may need to focus more on external assessment.

Dogherty, **E. J.**, **et al. (2010).** "Facilitation as a Role and Process in Achieving Evidence-Based Practice in Nursing: A Focused Review of Concept and Meaning." Worldviews on Evidence-Based Nursing 7(2): 76-89.

Further understanding of what facilitators are actually doing to enable changes in practice based on research findings will provide the groundwork for the design and evaluation of practical strategies for evidence-based practice. Research is needed to clarify how facilitation may be used to implement change in practice along with evaluation of the effectiveness of various approaches.

Farmer A., **P.**, **et al. (2008)** Printed educational materials: effects on professional practice and health care outcomes. Cochrane Database of Systematic Reviews DOI: 10.1002/14651858.CD004398.pub2

The results of this review suggest that when compared to no intervention, PEMs when used alone may have a beneficial effect on process outcomes but not on patient outcomes. Despite this wide of range of effects reported for printed educational materials, clinical significance of the observed effect sizes is not known.

Flodgren, **G.**, **et al. (2011)**. "Local opinion leaders: effects on professional practice and health care outcomes." Cochrane Database Syst Rev (8): Cd000125.

Opinion leaders alone or in combination with other interventions may successfully promote evidence-based practice, but effectiveness varies both within and between studies. These results are based on heterogeneous studies differing in terms of type of intervention, setting, and outcomes measured. In most of the studies the role of the opinion leader was not clearly described, and it is therefore not possible to say what the best way is to optimise the effectiveness of opinion leaders.

Forsetlund, **L.**, **et al. (2009)**. "Continuing education meetings and workshops: effects on professional practice and health care outcomes." Cochrane Database Syst Rev (2): Cd003030.

Educational meetings alone or combined with other interventions, can improve professional practice and healthcare outcomes for the patients. The effect is most likely to be small and similar to other types of continuing medical education, such as audit and feedback, and educational outreach visits. Strategies to increase attendance at educational meetings, using mixed interactive and didactic formats, and focusing on outcomes that are likely to be perceived as serious may increase the effectiveness of educational meetings. Educational meetings alone are not likely to be effective for changing complex behaviours.

Giguere, **A.**, **et al. (2012).** "Printed educational materials: effects on professional practice and healthcare outcomes." Cochrane Database Syst Rev 10: CD004398.

The results of this review suggest that when used alone and compared to no intervention, PEMs may have a small beneficial effect on professional practice outcomes. There is insufficient information to reliably estimate the effect of printed educational materials on patient outcomes, and clinical significance of the observed effect sizes is not known. The effectiveness of printed educational materials compared to other interventions, or of printed educational materials as part of a multifaceted intervention, is uncertain.

Gill, **P. S.**, **et al. (1999).** "Changing doctor prescribing behaviour." Pharm World Sci 21(4): 158-167.

We identified 79 eligible studies which described 96 separate interventions to change prescribing behaviour. Of these interventions, 49 (51%, 41%-61%) showed a positive significant change compared to the control group but interpretation of specific interventions is limited due to wide and overlapping confidence intervals.

Grimshaw, **J. M.**, **et al. (2012).** "Disseminating and implementing guidelines: article 13 in Integrating and coordinating efforts in COPD guideline development. An official ATS/ERS workshop report." Proc Am Thorac Soc 9(5): 298-303.

The Knowledge to Action cycle proposed by Graham and colleagues provides a useful framework for planning dissemination and implementation activities that emphasize the need for tailored approaches based on an assessment of local barriers. There are a broad range of interventions that are generally effective at improving the uptake of evidence. The best intervention depends on likely barriers, available resources, and other practical considerations. Financial interventions (such as pay for performance) appear to be as effective as other interventions that aim to change professional behaviour.

Harris J., **K. K.**, **et al. (2011)**. "Are journal clubs effective in supporting evidence-based decision making? A systematic review. BEME Guide No. 16." Medical Teacher 33(1): 9-23.

The effectiveness of JCs in supporting evidence-based decision making is not clear.

Ivers, **N.**, **et al. (2012)** Audit and feedback: effects on professional practice and healthcare outcomes. Cochrane Database of Systematic Reviews DOI: 10.1002/14651858.CD000259.pub3

Audit and feedback generally lead to small but potentially important improvements in professional practice. The effect of audit and feedback on professional behaviour and on patient outcomes ranges from little or no effect to a substantial effect. Audit and feedback may be most effective when: 1. the health professionals are not performing well to start out with; 2. the person responsible for the audit and feedback is a supervisor or colleague; 3. it is provided more than once; 4. it is given both verbally and in writing;5. it includes clear targets and an action plan. In addition, the effect of audit and feedback may be influenced by the type of behaviour it is targeting.

O'Brien, **M.**, **et al. (2007)** Educational outreach visits: effects on professional practice and health care outcomes. Cochrane Database of Systematic Reviews DOI: 10.1002/14651858.CD000409.pub2

Educational outreach visits alone or when combined with other interventions have effects on prescribing that are relatively consistent and small, but potentially important. Their effects on

other types of professional performance vary from small to modest improvements, and it is not possible from this review to explain that variation.

O'Brien, **M. A.**, **et al. (2001)**. "Continuing education meetings and workshops: effects on professional practice and health care outcomes." Cochrane Database Syst Rev (2): CD003030.

Interactive workshops can result in moderately large changes in professional practice. Didactic sessions alone are unlikely to change professional practice.

Parmelli, **E.**, **et al. (2011)** The effectiveness of strategies to change organisational culture to improve healthcare performance. Cochrane Database of Systematic Reviews DOI: 10.1002/14651858.CD008315.pub2

It is not possible to draw any conclusions about the effectiveness of strategies to change organisational culture because no studies were found that fulfilled the methodological criteria for this review.

Zaher, **E. and S. Ratnapalan (2012).** "Practice-based small group learning programs: systematic review." Can Fam Physician 58(6): 637-642, e310-636.

Current evidence suggests that Problem Based Small Group Learning is a promising method of continuing professional development for GPs. Such programs can be adapted according to learning needs. Future studies that focus on the changes in practice effected by Problem Based Small Group Learning will strengthen the evidence for this form of learning and motivate physicians and institutions to adopt it.

Appendix 6.3 Theories found in the scoping search

Theories concerning Groups	**Inner/receptive context**	**Mechanism**	**Outcome**
The knowledge of the group is greater than the sum of the knowledge of the individuals (Senge, 2006)	The group is capable of resolving complex problems – readiness of the group	Each member of the group participates actively; knowledge increases more than from an individual and disseminates to working places	Better performance
The optimum lies between 6 and 12 participants (Elwyn G, 2004)	Small groups are very efficient but lacking broad knowledge, large groups are inefficient	Optimal size of group allows optimal dynamics in the group, leading to optimal resolution of problems	Better performance
Theory about collective learning and trust (Cross et al., 2001, Gubbins and MacCurtain, 2008, Dirks and Ferrin, 2001)	Ability of collective learning is based on goodwill and identification within the group	The higher the trust in goodwill and integrity, the greater the willingness is of the collective to share knowledge and information	Better performance
The role of the facilitator (Elwyn G, 2004, Grol, 1995, Gerlach and Bahrs, 1994, Senge, 2006, Watkins et al., 2004)	Among colleagues, facilitating trust and communication in the group	Facilitators enable the group to focus on the problem in a supportive non-threatening atmosphere	Better performance
Adult Learning Theory (Sharon Straus, 2009, Holton et al., 2001, Mukhalalati and Taylor, 2019)	Self-directed group of adult learners	Adult learners have prior knowledge, focus on relevant, practical knowledge, study autonomously.	Better performance

Theories concerning Knowledge/Evidence	**Context**	**Mechanism**	**Outcome**
(Helfrich et al., 2010, Kitson et al., 2008)	Knowledge can be chosen by the group Knowledge that has to be implemented is implied	The group's intrinsic motivation to start the PDSA Cycle is high The group's level of motivation to start the PDSA Cycle is low	Improved performance Impaired performance
Research of high quality	QC/PRG	Evidence has to be of a high level to be accepted into the PDSA Cycle; therefore, SR and evidence-based guidelines are the most important sources and will more likely be implemented than other sources of evidence	Improved performance – the better the evidence the more likely the evidence will be implemented
Clinical experience	QC/PRG	Consensus in the group may lead to a better understanding of the issue in question	Improved performance – the clearer the consensus the more likely the implementation of the evidence
Patient preferences	QC/PRG	Patient experiences are routinely gathered enabling scrutiny of patient communications	Improved performance as to communication with patients

Theories about Knowledge in Groups	**Context**	**Mechanism**	**Outcome**
The organizational perspective of knowledge (Sharon Straus, 2009, Peter J, 1998, Dopson, 2007)	Characteristics increasing the ability to manage knowledge: • Organizational and professional autonomy • Organizational flexibility and decentralization • Value of knowledge to improve performance • Value of knowledge to resolve emerging problems • Resources covering innovative projects and their associated risk • Access to scientific knowledge • Balance between (organizational) autonomy and stimulation to improve performance • Organizational mechanisms/systematic evaluation to select promising projects	The group is able to manage knowledge	Better performance
The organizational perspective of knowledge (Sharon Straus, 2009, Peter J, 1998, Dopson, 2007)	Characteristics improving the process: • Social processes that support the formation and circulation of knowledge • Knowledge use and transformation within a network of interested professionals in a social structure • Accepting local adjustments of knowledge allowing for customized knowledge to fit organizational pluralism	The group is able to work in a more efficient way	Better performance

	• Accepting tacit beliefs about innovations in order to make them explicit • Ability to agree on a common solution despite controversies • Balance between (organizational) autonomy and stimulation to improve performance		
The organizational perspective of knowledge (Straus S, 2009, Peter J, 1998, Dopson, 2007)	Codified knowledge to generate and stimulate performance: • Clinical practice guidelines • Quality indicators • Performance management system • Electronic medical record	Access to data that can be translated into information and knowledge. Well-organized and accepted feedback system	Knowledge increase Better performance

Theories about Action and Motivation	**Context**	**Mechanism**	**Outcome**
Theories concerning the process of action and change (Tross, 2003, Gerlach and Bahrs, 1994, Marinker, 1995, Grol, 1995, Fraser et al., 1999, Lawrence and Schofield, 1993, Kolb, 1984)	Plan Do Study Act Cycle approved in the group audit and feedback system available	The PDSA Cycle enables a circle of quality improvement if there is a correct feedback system	Knowledge increase Better performance
Kotter's organizational theory (Kotter, 1998)	Feedback in the form of codified knowledge	Creates a sense of urgency and leads to understanding of knowledge. The group communicate their new ideas and take action according to the PDSA Cycle	Knowledge increase Knowledge dissemination Better performance
Social cognitive theory (Bandura, 2001)	Dynamics within the group	Efficacy expectations steer behaviour, which is influenced by outcome expectations.	Action is taken

Vital factors for intrinsic motivation (Epstein and Hundert, 2002)	• Autonomy, which is a state of self-determination • Relatedness provided by attentive group • Promoting the feeling of being competent	If individuals feel autonomy and relatedness in the group, they feel competent and intrinsic motivation increases	Intrinsic motivation increases Action is taken
Vital factors for extrinsic motivation (Ryan and Deci, 2000)	• Identification: a conscious choice of different degrees of assimilation of regulations • Internalization: regulations are fully accepted, assimilated and have become congruent with other pre-existing values, which increases autonomy	If members of the group make a conscious choice of assimilating regulations and gradually internalize them until they become congruent with pre-existing values: their extrinsic motivation increases parallel to this process	Extrinsic motivation increases Action is taken

Theories concerning the Setting	**Context**	**Mechanism**	**Outcome**
Administration (Helfrich et al., 2010, Weiner, 2009, Kitson et al., 2008)	Effective supportive administration	This enables the group to do their work	Knowledge creation and dissemination
Economic Setting (Helfrich et al., 2010, Weiner, 2009, Kitson et al., 2008)	Work in the group is acknowledged as part of the regular working schedule	Individuals become aware that their work in the group is as important as their work in their normal professional role, which motivates them to deal with knowledge creation, dissemination and quality improvement	Knowledge creation and dissemination Better performance

Culture (Helfrich et al., 2010, Weiner, 2009, Kitson et al., 2008)	Learning organization is part of the official policy of the company	The same mechanism as under the section "organizational perspective of knowledge" (p8)	Knowledge creation and dissemination
Leadership/Regulations (Helfrich et al., 2010, Weiner, 2009, Kitson et al., 2008)	QCs are enforced by the health insurance company or by political regulations	• Sense of autonomy is lost • External motivation factors can become congruent with internal values and lead to improved work in the groups	• Bad performance • Better performance
Facilitation (Elwyn G, 2004, Grol, 1995, Gerlach and Bahrs, 1994, Senge, 2006, Watkins et al., 2004, Dogherty et al., 2010)	• Facilitator enables the group to implement knowledge • No access to facilitator • Specialized facilitator • Facilitator has many groups • Facilitator not trained	• By showing respect, empathy, authenticity, credibility, relatedness to the group • This makes the process difficult • More authority, a greater remit and flexibility • No relatedness • No skills to lead the group professionally	• Improved process and outcome • Bad performance • Better performance • Bad performance • Bad performance

Appendix Chapter Seven

Appendix 7.1 Quotes of interviews and focus groups in phase II

Sources:

(1) D.J., economist, CEO of Santémed network of primary health care centres, partly owned by health insurance company [interview]
(2) O.R., GP, tutor in MediX Bern, a doctor-owned network of primary health care centres [interview]
(3) V.M + E.K., social scientists, representatives of the professional body Swiss Association of Medicine [interview]
(4) 8 Participants, GPs, and a QC facilitator belonging to MediS Zürich, a doctor-owned network of primary health care centres [focus group]
(5) M.J., GP and manager, facilitator and member of Sanacare's management board, a network of primary health care centres owned by health insurance companies [interview]
(6) 12 Representatives of the quality committee of the Swiss Society of General Internal Medicine, GPs [focus group]
(7) 24 delegates of the European Society of Quality and Safety in Family Medicine, all GPs [focus group]

Establishment of QCs and their group size

Context mechanism outcome configuration I: 'sharing similar needs'

If health insurance companies require QI and physician network organisations provide protected time and space, CME points, and small financial incentives for participants (C), then GPs meet in groups to exchange ideas (O), because the organisational support generates positive expectations among participants and they believe these meetings with their peers will be useful (M).

QCs give us the opportunity, with all experts in one room, to concentrate on one topic [translated from German] (1).

Staff members get into conversation with each other, GPs communicate with each other on a social level and interact professionally [translated from German] (1).

The network (health insurance companies) has interests that must be addressed [translated from German] (2).

At least 10 QCs per year are mandatory; EQUAM stipulates the topic areas: 2x guidelines, 2 CIRS, 1 preferred provider organisation and 1 evidence-based medical training, as well as external consultants. The form, however, can be selected [translated from German] (2).

Doctors with a similar professional background meet to discuss problems [translated from German] (3).

Organisation is important to create space, in terms of time, place and mentally, so that sensitive issues can be discussed [translated from German] (3).

QC activities can be made mandatory by the network or the employer [translated from German] (3).

Continuing education credits can be motivating [translated from German] (3).

Nobody feels forced - although the network stipulates 20 QCs per year; there is a reward that is nice to have but no real motivation, even if it is about an hour's work [translated from German] (4).

In QCs, colleagues engage in a lively exchange of ideas; a quick exchange between colleagues is possible [translated from German] (4).

Health insurance companies or physician networks expect that GPs participate in quality improvement measures as part of the corporate culture [translated from German] (5).

We organise QCs because of a fascination for the complete diversity of the profession [translated from German] (6).

Participants choose a topic that interests everyone and then work on it [translated from German] (6).

External incentives (other than money) can definitely work and sustain the long-term effect [translated from German] (6).

Context mechanism outcome configuration II: 'size of the group affects communication'

If group size exceeds 15 (C), then communication becomes difficult (O), because participants cannot keep track of so many people (M).

That a maximum of 8-14 doctors meet regularly - at least ten times a year is mandatory [translated from German] (2).

The process came to a halt when there were more than 20 members in the group, so the QC could no longer offer everyone a platform for discussion [translated from German] (4).

QC work is only efficient with up to twelve well-trained people at the table [translated from German] (5).

Establishment of a safe environment

Context mechanism outcome configuration III: 'need for relatedness'

If a steady group of members engages in socially enjoyable contact, led by a skilled facilitator who, e.g., introduces people to each other, opens discussions, and clarifies and summarises statements (C), then group members will get to know each other and decide on rules that they are willing to follow, building a safe environment based on trust (O) because members want to be among and to interact with equals (M).

Social bonding is probably a prerequisite for professional exchange and development. Since the social structure also exists outside the QC, the management hopes for exchange outside the QC and, in summary, economic benefits [translated from German] (1).

A feeling of belonging to a group is created, which results in QC work with good results [translated from German] (2).

A climate of familiarity and good mutual interaction in a pleasant atmosphere favours openness and mutual trust. What people think is positive and fun will be repeated [translated from German] (2).

Didactic techniques: looking for topics, facilitators often use 'multi-plan techniques', 'brainstorming', 'free discussion', 'flashlight' techniques. Hardly any consultants are involved. Case discussions take place according to a special format. There is always an agenda [translated from German] (2).

Regular feedback to the participants builds trust and shows the benefit for the participants [translated from German] (3).

Continuity is important in relation to topics and participants [translated from German] (3).

There's food and that's fun [translated from German] (4).

It is fun and therefore we continue [translated from German] (4).

Free, facilitated discussion, where the mutual trust that has been established is important. Trust in the sense of the openness described above and the certainty that personal information will not leave the room [translated from German] (4).

You feel you that you are in the right place - in a physician-owned group practice with budget responsibility - being and belonging together [translated from German] (4).

Facilitators promote mutual transparency and trust [translated from German] (4).

Introducing participants to each other is important as is introducing the topic, sometimes with an external speaker, followed by free discussion with facilitation to ensure that the discussion is goal-oriented [translated from German] (5).

Commitment to deadlines and consistency is important [translated from German] (6).

Y (Denmark): a very important aspect is the social aspect because we enjoy ourselves when meeting and we have a lot of fun (7).

M (Ireland): social benefits of QCs are important – we have a bite to eat and have a drink and enjoy ourselves (7).

K (Austria): - it is especially important for GPs in Austria because we have sole-person practices (7).

G (Germany): in our QC the host has to cook for the others (7).

Actively engage in the group and discuss a topic, guided by a facilitator in a goal-oriented manner [translated from German] (5).

C (Denmark): it is important to have a facilitator who guides the group towards an open discussion, moderate discussions, manage interactions and maybe lead (7).

J (Norway): it should be a leader but not too much of a leader, the facilitator should know QI tools and tools for leading a group (7).

G (Germany): You have to develop the atmosphere: I feel comfortable in in a group of peers where I like to share my thoughts (7).

K (Austria): we (GPs) speak the same language, we understand each other in the groups, have the same understanding of each other's problems, which allows very close contact (7).

M (Ireland): it is important that "things stay in the group" (7).

M (Sweden): some take up their responsibilities and prepare, others just turn up; you have to be clear about the rules and responsibilities (7).

Context mechanism outcome configuration IV: 'need for autonomy'

If the group chooses its own topics and facilitator (C), then it has a sense of ownership (O), because this satisfies the need for autonomy and control (M).

Autonomy regarding the topic should keep the intrinsic motivation alive [translated from German] (1).

Participants decide on the programme, but 20-30% is determined by the physician network [translated from German] (2).

The participants' motivation also depends on the choice of topic - as there is autonomy regarding the choice of topic (almost?), this is not an issue [translated from German] (4).

The facilitation only serves as a "dynamic motor", but the facilitator must be one of us for it to work (facilitation) [translated from German] (4).

What is developed in the QC and what is done with it is the responsibility of the medical professionals, it must be a kind of self-administration [translated from German] (6).

A (Portugal): instead of being an expert or a bureaucrat, it should be some kind of coach or rather one of us, one we choose, who motivates the members of the group and keeps the focus (7).

Exchange of experiences and failures

Context mechanism outcome configuration V: 'need for competence and self-actualisation'

If participants can tell their stories and experiences with the facilitator's support (e.g., encouraging interactive responses, discussions, and summarizing statements) in a safe environment (C) then they are involved in exchanging experiences and failures (O), because they want to be competent, gain professional confidence, and fulfil their professional potential (M).

The facilitator establishes the confidence that information will not leave the room [translated from German] (4).

GPs with a similar professional background meet to discuss their problems and open their minds to allow a reflective solution [translated from German] (3).

Professional development can feel good – it increases improvement in self-esteem and leads to satisfaction [translated from German] (3).

Free, facilitated discussion, where the mutual trust that has been established is important. Trust in the sense of the openness described above and the certainty that personal information will not leave the room [translated from German] (4).

There is an exchange of knowledge and experience, including critical events that can be addressed and discussed [translated from German] (6).

QCs offer the opportunity to share failures and learn lessons from them [translated from German] (6).

G (Germany): it is the atmosphere: I feel comfortable in in a group of peers where I like to share (7).

H (France): it (QC) is about speaking the truth (7).

E (Sweden): - it is about yourself, your own practice and your own patients you talk about….it is self-involvement, so the group is very important (7).

provide space and time Identification of learning needs

Context mechanism outcome configuration VI: 'previous knowledge is activated'

If participants exchange case stories and experiences while they actively listen to each other in the presence of a skilled facilitator (C), then they will be motivated to share their knowledge through telling their own relevant stories (O), because the process activates the knowledge they already possess (M).

Discussion of cases activates pre-existing knowledge and participants become aware of the gaps in their discussion [translated from German] (3).

When participants discuss clinical cases, they exchange knowledge during discussions. They stimulate each other to disclose their tacit knowledge and informally exchange thoughts at various levels, including the social levels of everyday working life [translated from German] (6).

Context mechanism outcome configuration VII: 'cognitive dissonance'

If participants discuss and reflect on their work processes during a professionally facilitated exchange of positive experiences or failures (C), then they become aware of knowledge gaps and identify learning needs and relevant topics (O) because conflicting attitudes and behaviours, together with differences between their own and other participants' knowledge, causes a cognitive dissonance (M).

Participants dare to show what really happens during office hours [translated from German] (2).

Identification with the topic is important and requires careful targeting, i.e. something that is important for everyone in the discourse, and a precise definition of the problem [translated from German] (2).

Exchange of experience in the group about different cases helps to define the topic and motivates the group to cooperate [translated from German] (2).

In discussions about their own cases and experience, they will be willing to open up, find the problems and deliver a reflective solution, because the topics become so practice-oriented, burning and interesting [translated from German] (3).

When we create room to discuss sensitive issues in a timely, local and mindful manner, we can look at sensitive issues and critical cases [translated from German] (3).

We can ask each other questions about cases; professional exchange is highly efficient in the group [translated from German] (4).

When participants show each other what they are doing, it is like a reality check because you experience the reaction of the other participants and that helps to improve patient care in general; your clinical practice; and the group is a good tool to make you recognise gaps in knowledge [translated from German] (4).

Group dynamics is beneficial to the process and promotes motivation, even when it is stormy and turbulent [translated from German] (5).

The choice of topic is important, i.e. participants must formulate a clear hypothesis, a problem, so that it can be improved. Sometimes, participants want to cover too much at a time [translated from German] (5).

After discussing cases, participants choose a topic that interests everyone and then tackle it [translated from German] (6).

On the basis of trust, participants disclose their own working methods during the case discussions [translated from German] (6).

Case discussions offer the opportunity to share failures and learn from them [translated from German] (6).

Case discussions often lead to a feeling of togetherness [translated from German] (6).

Creating a learning environment

Context mechanism outcome configuration VIII: 'social learning'

If the participants know what they need to learn or know what topic they want to discuss, and if they reflect on their own and other participants' trustworthy data (their own cases, diagnostic habits or prescription patterns, or evidence-based material such as guidelines) and the facilitator uses purposeful didactic techniques (like brain-storming, discussions, and role play) to keep the group active and to reward exploratory behaviour (C), then the group will create a learning environment that promotes knowledge exchange (O), because learning is a cognitive process in which participants observe and imitate their peers' behaviour to gain social approval (M).

Feedback from measurable indicators chosen by the QC should be available (laboratory or prescription patterns as indicators, or others) [translated from German] (1).

QC participants learn how to deal with mistakes. QCs promote a culture of sharing cases and data with colleagues [translated from German] (3).

You should assess and measure present behaviour, and make measurements before and after, otherwise there is too little pressure and no changes [translated from German] (4).

With the focus on one topic, the participants freely discuss and work out what could be improved and how [translated from German] (5).

Participants want to gain an outside view of their own activity and reflect, which requires a certain amount of openness [translated from German] (5).

When you compare your practice with your colleagues', then you feel more confident about your own qualities [translated from German] (5).

Ch (Denmark): looking at other (GPs') practices can be motivating – competition can be stimulating and make you think (7).
J (Norway): …. competition – you have to reflect on your own data and others'….so it is both self-reflection and group competition (7).

Facilitators enable participants to actively deal with a topic [translated from German] (5).

A (Portugal): the data that are used should be reliable …. GPs should be in control of the data and in control of how they are analysed (7).

G (Germany): it is important that the group can look at and reflect on their own data and compare them within the group (7).

Creating new or locally adapted knowledge

Context mechanism outcome configuration IX: 'interdependence between health insurance companies and physician network organisations/QCs; conflict between autonomy and obligation'

If physician network organisations require continuous QC activities (C), then QCs will negotiate priorities and design creative solutions (O) because the tension between autonomy and obligation spurs the group to act and negotiate together to reach a common goal (M).

When QCs are mandatory, they become a clear task for quality improvement. Participants can decide on its content [translated from German] (1).

Most insurance companies have QCs as a measure to involve physician networks in QI. So, they are actually external quality requirements [translated from German] (1).

People think that QCs are not mandatory even though they are linked to CME credits and participation in physician networks that sign contracts with health insurance companies [translated from German] (3).

The conflict between autonomy and the expectations of the management must be clear so that the QC can be creative [translated from German] (5).

Context mechanism outcome configuration X: 'interdependence among group members'

If participants maintain a learning environment characterized by trust and knowledge exchange, assisted by facilitators who use professional techniques (e.g., contentious discussion, reaching consensus, and role play, (C), then participants will generate new knowledge and adapt it for local use, giving them a sense of ownership (O), because they see themselves as similar, and thus act and negotiate cooperatively to achieve a common goal (M).

QI does not necessarily lead to a decrease in the costs in PHC. The health insurance companies are content if QI does not lead to a cost increase [translated from German] (2).

The Board of Directors primarily focuses on economic results, and QCs on medical outcomes, keeping track of economy [translated from German] (2).

Actively dealing with a topic, purposefully guided by a facilitator, promotes intrinsic motivation; QCs are based on voluntary actions. Intrinsic motivation is a driving force together with the pressure from role models and the policy of the company [translated from German] (5).

Leadership is important to keep the group focused - the facilitator must be focused to keep the goal in view [translated from German] (5).

You get to know and understand new evidence, deal with quality improvement and strive for goals [translated from German] (5).

Participants get the opportunity to optimise their own activities through exchange and thus the chance to be creative and introduce something new [translated from German] (6).

Discussions about personal cases and data often lead to common goals and a feeling of togetherness [translated from German] (6).

Adapting knowledge to local conditions is important so that it can be applied afterwards [translated from German] (6).

Implementation of new knowledge in everyday practice

Context mechanism outcome configuration XI: 'gaining confidence in innovations'

If the group repeatedly practises implementing and adjusting to an innovation (C), then they trust their own competence and turn the innovation into a habit (O) because successful outcomes increase their confidence in their abilities (M).

Regular feedback of the results to the participants builds trust, shows the benefit for the participants and leads to routine [translated from German] (3).

QCs should not lose their focus. The topics should make sense to them. It is also important to repeat topics. QC groups should meet at regular intervals. This is good for social bonding but also for training in QI techniques [translated from German] (3).

Context mechanism outcome configuration XII: 'gaining confidence in QC techniques'; 'repetition priming and automaticity'

If participants build a consistent group and practice using QI tools (C), then they will successfully implement new knowledge into everyday practice (O) because successful responses increase with repetition or in other words 'practice makes perfect' (M).

Repetition and continuity in the group are important for cohesion and the skilled use of QC techniques: 8-14 doctors meet regularly - at least 10 (QCs) per year are therefore mandatory in the network [translated from German] (2).

Continuity of the group is important, as well as repetition to establish behaviour change [translated from German] (3).

The repetition promotes the learning process [translated from German] (6).

Appendix Chapter Eight

Appendix 8.1 CMO configurations in each cluster or article

Kinship papers: Norwegian CME groups

Project Identifier: Norwegian CME

(Straand et al., 2006, Gjelstad et al., 2013, Gjelstad et al., 2006, Brekke et al., 2008, Frich et al., 2010, Rognstad et al., 2013)

Topic: inappropriate prescribing habits

Location: Norway

Dates Covered: 2006 - 2013

Overview

Inappropriate prescribing patterns concerning patients with upper respiratory tract infections and inappropriate prescriptions for elderly patients are common problems within primary health care. The authors organised workshops on the topic followed by discussions and reflective thinking of prescription patterns in groups to change behaviour.

Objectives

The intention of these papers was to evaluate whether QCs work could improve prescription patterns. The intervention consisted of a workshop like atmosphere, audit and feedback followed by educational outreach visits by tutors and discussion of individualised prescription patterns. Different aspects of one study were reported in six papers.

Context

In southern Norway, researchers included pre-existing CME groups who met once a month in a cluster randomized controlled trial. The intervention group for better prescribing for the

elderly served as a control group for better prescribing of antibiotic for patients with upper respiratory tract infections and vice versa. The researchers recruited 13 GPs as tutors. They received a three days' training in appropriate prescriptions, pedagogic techniques and software use. The intervention took 6 months and was evaluated after one year.

Intervention activities

For each intervention group, the researchers held a one-day regional training course in appropriate prescription of antibiotics or inappropriate drugs for elderly in the region. The tailored intervention included two visits of the tutor to the groups, audit and feedback followed by academic detailing and discussions of the results among group members.

Main quantitative outcomes

Prescription habits improved slightly. The effect size was small for the overall group. However, the researchers noted large effect sizes for increase of favoured phenoxymethylpenicillin prescriptions in patients with upper respiratory tract infections and decrease of unfavourable prescriptions for the elderly such as antipsychotics and combinations of Vitamin K antagonist and NSAID.

Main qualitative outcomes

GPs who were able to discuss their individual results in the group reported that they reflected alternatives more often when prescribing drugs. However, inappropriate prescribing results put some GPs in distress in front of the group. Some participants also experienced the scheme as time consuming.

Main themes and propositional statements

Outcome 1: addressing practitioners' needs

Mechanisms: sharing similar needs / size of group affects communication

…as a so called "clinical theme-course", which will give the participants important CME credits (Straand et al., 2006)

In Norway, specialists in general practice must renew their clinical specialty every five years. In this renewal process, participation in a number of peer CME group meetings are compulsory, in order to stimulate a continuously medical education and reflection (Gjelstad et al., 2006).

CME group members earned CME points to renew their speciality (Frich et al., 2010).

General practitioners (GPs) favour learning environments such as reading journals, discussion with colleagues, and participation in quality circles (Frich et al., 2010).

GP specialists have to renew their specialty every 5 years. Recertification demands participation in a number of peer CME group meetings. Typically, a peer CME group comprises seven or eight GPs who set up their own educational programme for monthly evening meetings (Rognstad et al., 2013).

All GPs participating in such peer groups, on average consisting of six to eight peers, located in southern Norway (Straand et al., 2006).

Outcome 2: forming and Norming the Group

Mechanisms: need for relatedness / need for autonomy

The groups were different ... we thought that a group is a group and all we have to do is to run the scheme ...and then I experienced that groups have their own cultures. These groups have existed for a while, which we probably have to consider in a programme like this (Frich et al., 2010).

Tutors did not consider themselves as "experts" but as "one of them". …, and tutors deliberately tried to avoid being perceived as experts: The tutors experienced that their own background was important for GPs' trust and acceptance (Frich et al., 2010).

Both tutors and GPs emphasised that a "good atmosphere «in the group, and "a sense of security" among group members was essential for an open and constructive discussion (Frich et al., 2010).

The tutors did not consider themselves to be experts, but rather as 'members of the same family and this, combined with their independence from both the pharmaceutical industry and health authorities, was probably important in obtaining GPs' trust and acceptance (Rognstad et al., 2013).

The extra benefits gained by using GPs instead of non-physicians as (facilitators) have also been reported in a Dutch study (Rognstad et al., 2013).

Outcome 3: exchanging experiences and failures

Mechanisms: need for competence and self-actualisation

…. that an improvement in prescription behaviour could be obtained in a group setting where the participants knew each other well and were used to discussing challenging topics related to their own clinical practices (Gjelstad et al., 2013).

Both GPs and tutors experienced that sharing the experience of being a GP contributed to an open and constructive discussion (Frich et al., 2010).

Reflective thinking increased among GPs; they were able to reflect their individual prescription habits in the CME group. Inappropriate results could put some GPs in distress in front of the group (Frich et al., 2010).

Outcome 4: identifying learning needs, planning actions, setting priorities and goals

Mechanisms: previous knowledge is activated / cognitive dissonance

The identification of suboptimal pharmacological treatments to be targeted in this study, was based on previous research and active reflection and discussions based on own clinical experience from general practice (Straand et al., 2006).

They will facilitate the discussion …, based on … feedback reports, enabling participants to compare own prescription patterns with overall averages. This will probably trigger discussion within the peer group, … critical reflection towards own prescription strategies … and facilitating disclosure of areas where individual improvements may be desirable (Straand et al., 2006, Gjelstad et al., 2006).

In the continuing medical education group setting, each participant was confronted with, and had to reflect on, the baseline report on their own prescription practice. We believe that this was a key component for obtaining improved prescription habits (Gjelstad et al., 2013).

We consider the key element in our study to be "What happens to a general practitioner's prescribing behaviour when he or she reflects on his/her prescriptions?" (Gjelstad et al., 2013).

Our intervention required general practitioners to expose their own antibiotic prescribing data in their continuing medical education group by using a structured pedagogical method, critically reflecting on the need for change together with an active listener (Gjelstad et al., 2013).

Academic detailing involves educational outreach visits and incorporates external audit and supervision, and has a larger effect on prescribing than dissemination of educational materials, audit or feedback alone (Frich et al., 2010).

Peer group academic detailing was experienced as a suitable method to learn more about pharmacotherapy, though there were participants who argued that the scheme was time-consuming (Frich et al., 2010).

GPs' "hits" for inappropriate prescriptions in the elderly, or an unfavourable antibiotic prescription profile, was the starting point for group discussions at the second meeting. Tutors reported that GPs' tried to justify and explain their practice (Frich et al., 2010).

Our results are in concordance with research that suggests that GPs may feel disappointment if their prescribing practice conflict with their ideals (Frich et al., 2010).

One important outcome for the GPs was an experience of being more reflective in decision-making about prescriptions (Frich et al., 2010).

I was surprised to see how willing people were to reflect on their own behaviour and practice ... and constantly comment like: "Well, did I really do that? I surely have to pull myself together". Very strong will, apparently, to make changes (Frich et al., 2010).

The older ones were silent, because they had a prescription profile … far from what was recommended. The young ones dominated the discussion, and they were much more familiar with the guidelines …. … the old felt distress when disclosing their profiles ..... old habits are difficult to change (Frich et al., 2010).

GPs were generally more embarrassed if they had hits, they knew they should have avoided, such as prescribing flunitrazepam to elderly patients, compared to potentially harmful drug combinations that had not been highlighted in the recommendations (Frich et al., 2010).

A shared understanding of the complex decision-making involved in prescribing in general practice was reported by both GPs and tutors as essential for an open discussion in the CME groups (Frich et al., 2010).

GPs … experienced the CME group as a safe setting to present and discuss their feedback reports: …. I am not the kind of person who would present all sorts of data ... but to discuss it with three to four persons ... that's okay (Frich et al., 2010).

Outcome 5: creating the learning environment

Mechanisms: social learning

The identification of suboptimal practice is, however, only the first step for quality improvements. Several educational strategies have been used to improve doctors' clinical practice, but substantial effects are only rarely reported (Straand et al., 2006).

… found evidence that educational intervention consisting of passive dissemination of clinical practice guidelines had little or no effect on practice. This corresponds with later reports … More active strategies, like educational outreach visits and multifaceted interventions, are more effective, but require more resources (Straand et al., 2006, Gjelstad et al., 2006).

The elements of the intervention are discussions within the peer group, collection of individual prescription data, audit based on individual feedback reports, as well as a one-day regional work-shop (Gjelstad et al., 2006).

GPs generally experienced the CME group as a safe setting to present and discuss their feedback reports (Frich et al., 2010).

I was surprised to see how willing people were to reflect on their own behaviour and practice ... and constantly comment like: "Well, did I really do that? I surely have to pull myself together". Very strong will, apparently, to make changes (Frich et al., 2010).

The participating GPs experienced the CME group meetings as an important arena for learning. They reported picking up good advice from others and learning practical alternatives …. GPs said their prescription data would not mirror all learning effects: 'The whole point is to reflect more, … (Frich et al., 2010).

Peer group academic detailing was experienced as a suitable method to learn more about pharmacotherapy, though there were participants who argued that the scheme was time-consuming (Frich et al., 2010).

Outcome 6: seeking solutions and adaptions, creating new knowledge

Mechanisms: interdependence between insurers and QCs / interdependence among group members

Therefore, it is recommended to address potential barriers to change when tailoring an intervention targeting change in medical performance (Straand et al., 2006, Gjelstad et al., 2006).

… that combining information from a peer detailer with reflection on one's own need for change together with trusted colleagues would improve prescribing patterns (Gjelstad et al., 2013).

Balancing interests and concerns is an essential aspect of GPs' work (Frich et al., 2010).

GPs said that the feedback on their prescription profile motivated them for reflection, learning, and change. Critical reflections on own strategies help change attitude and behaviour (Frich et al., 2010).

…. facilitated the discussion within the CME group, where each GP exposed their own prescription patterns as presented in his or her report and potentials for improvements were discussed within the group (Rognstad et al., 2013).

Outcome 7: systematic use of new knowledge

Mechanisms: repletion priming and automaticity

Contextual levels

- The level of the individual (capabilities and motivations)
- The group level (the group and the facilitation process)

The findings underscore that tutors have an important role in managing distress and contributing to an informal and relaxed atmosphere in peer academic detailing groups (Frich et al., 2010)

….and (x) how to facilitate learning within a group setting (Rognstad et al., 2013).

- The organizational level (e.g., within a network that provides primary health care)
- The national bureaucratic level (e.g., the Federal Office Public Health or similar administrative body)

Theories

Practitioners thoroughly analyse their performance, reflect on the results and combine theoretical knowledge with practical actions.

Kinship papers: CQI groups in the Netherlands

Project Identifier: CQIs in the Netherlands

(Geboers et al., 1999, Geboers et al., 2001, Engels et al., 2003, Engels et al., 2006)

Topic: continuous quality improvement (CQI) in small practices

Location: Netherlands

Dates Covered: 1999-2006

Overview

CQI in small peer group was developed in the late nineties. It is an approach to improve different domains of practice management and clinical skills. This approach is based on the PDCA cycle where the staff choose a topic, observe practice, compare performance with targets and implement change. The group repeats the cycle time and again.

Objectives

The intention of the studies was to evaluate whether the CQI model was appropriate to improve different quality aspects in Dutch practices using the team-based approach.

Context

The CQI model was introduced into Dutch practices in the late nineties. In the Netherlands, GPs run their practice together with their practice assistants (PA). PAs perform administrative tasks, routine diagnostic and therapeutic interventions. Groups consisted of the staff working in the same practice. Visitation Instrument for Practice Assessment (VIP) was widely used. This

instrument included indicators covering the various dimensions of the practice. One of the studies included exclusively midwives who met among peers to change clinical practice and to improve clinical skills.

Intervention activities

Interested PAs were trained as outreach visitors and operated as facilitators to introduce the CQI model. Researchers and trained PA introduced the model using a structured strategy. During a monthly staff meeting, they provided *detailed oral and written feedback* about an *audit* where data were gathered during half -day practice assessment using the VIP. The staff could choose between different topics related to diabetes mellitus, chronic obstructive lung disease or hypertension. Alternatively, they could choose a topic from the practice assessment. They discussed weak aspects of the performance. The team chose suitable topics for improvement. The process followed the PDCA cycle. The staff formulated the target, identified potential barriers and implemented change to finally evaluate the results. In the study about midwives in primary health care, participants could not choose their topic. The goal was to continuously apply the model. Evaluations took place after 12 to 18 months.

Main quantitative outcomes

The CQI seemed practicable for small Dutch practices. In the end of the study time, the staff was willing to continue and perceived the intervention as successful. Among midwives, clinical practice could be changed but clinical skills could not be improved. The amount of finished QI projects increased but the main study involving 49 practices was underpowered and the result therefore unsure.

Main qualitative outcomes

Numerous comments on barriers of the model were gathered during the survey. Lack of time and lacking time to plan activities were the most important barriers to using the CQI model. Man

participants considered the workload too high compared to its positive aspects. Some people complained about paperwork.

Main themes and propositional statements

- New stage: ***introduction of the model***

The introduction strategy included a meeting with all staff in which the model was explained, a manual on theoretical and practical backgrounds of the model; support in the use of the model and the start of a first improvement project; a one-day course on quality management (Geboers et al., 1999).

This (small projects) seems to be in accordance with previous findings where improvement of the internal structure is often seen as the first step towards the full adoption of continuous quality improvement. It is sensible therefore to advise practices to start with this kind of improvement project (Geboers et al., 1999)

Our findings stress the importance of starting CQI with small, easy-to-handle projects (Geboers et al., 2001).

For CQI to be introduced successfully, a positive attitude toward CQI is required from all who will be working with it (Geboers et al., 2001).

(they) learned how to organise the meetings, how to guide the members of a peer group through the steps of the quality circle, and how to deal with group processes (Engels et al., 2003).

Outcome 1: addressing practitioners' needs

Mechanisms: sharing similar needs / size of group affects communication

Staying close to the needs and expectations of the practices could be a way to introduce continuous quality improvement more effectively (Geboers et al., 1999).

The peer groups met on a regular basis (Engels et al., 2003).

Outcome 2: forming and Norming the Group

Mechanisms: need for relatedness / need for autonomy

it consists of involving all staff, holding regular meetings on quality, designating a quality coordinator, and writing annual plans and reports on quality improvement (Geboers et al., 1999).

…. were willing to continue using the model, but were less positive about the quality cycle and preparing an annual report.(Geboers et al., 2001).

(many physicians) …. felt that activities not directly related to practice work (Geboers et al., 2001).

A final limitation, caused by the study design is the fact that the peer groups did not have the opportunity to choose their own topics, …. After reading and discussing the content of the workbooks the peer-review groups defined self-selected change objectives (Engels et al., 2003).

A bottom-up approach to CQI stands central along with an active role for the practice team and the application of a clearly structured, stepwise problem-solving method to develop and implement the improvement plans (Engels et al., 2006).

Outcome 3: exchanging experiences and failures

Mechanisms: need for competence and self-actualisation

Outcome 4: identifying learning needs, planning actions, setting priorities and goals

Mechanisms: previous knowledge is activated / cognitive dissonance

It is crucial to the model that practice teams formulate goals for improvement and attempt to achieve these goals in small scale (Geboers et al., 1999).

Reasons that were reported most often included "the subject chosen was felt to be a problem or a bottleneck in practice management", "the practice wanted to implement the national guidelines (on that specific topic)", and "the outcomes of the audit report" (Geboers et al., 1999).

As practices were free to select their own topics for improvement and set their own objectives, the fact that the intervention group met a significantly greater number of self-defined improvement objectives than the control group is an important finding (Engels et al., 2006).

Outcome 5: creating the learning environment

Mechanisms: social learning

The systematic approach of the quality cycle was used reasonably well, although practices did have some difficulties in gathering data and evaluating progress in the improvement projects (Geboers et al., 1999).

An intensive small group education and peer review programme, which combined various strategies, was proved to influence aspects of knowledge, skills, opinions, and the presence of equipment according to the guidelines but on its own no significant influence on the provided care (Geboers et al., 2001).

… working on projects… is … of great advantage. Everyone is involved …has to prepare something for the next meeting. The structure of the quality cycle committed us to make all steps …. You don't cling to ideas but …come to changes. Evaluation … is … important (Geboers et al., 2001).

It should be noted that a new skill is required for the recommended technique. It is possible that many midwives have not as yet learnt these skills. Small group CQI is not sufficient for the teaching of new techniques (Engels et al., 2003).

We found that small peer group CQI had a positive effect on changing clinical practice when no new skills had to be learnt, when the recommendations were considered to have more advantages than disadvantages, and when there was no 'ceiling effect' at baseline (Engels et al., 2003).

Outcome 6: seeking solutions and adaptions, creating new knowledge

Mechanisms: interdependence between insurers and QCs / interdependence among group members

it appears to be essential that throughout the implementation personal obstacles are addressed (Geboers et al., 2001).

Outcome 7: systematic Use of new knowledge

Mechanisms: repletion priming and automaticity

Favours change: Having regular practice meetings on quality improvement with all staff (Geboers et al., 1999, Geboers et al., 2001).

Successful projects might not only positively reinforce the introduction of CQI, but could also bring about a positive attitude to the other aspects of systematic and continuous quality improvement (Geboers et al., 2001).

Regular meetings with the practice team was selected as a topic for improvement by several of the practices (Engels et al., 2006).

Contextual levels

- The level of the individual (capabilities and motivations)
- The group level (the group and the facilitation process)

They (facilitators) were trained in the contents of the model, how to support practices in the use of the model, and in application of the quality cycle and its tools and techniques (Geboers et al., 1999).

Involving all staff and designating a Q coordinator was of importance (Geboers et al., 1999).

A cyclic process … is used which leads project teams through the improvement projects. This means that after having chosen a subject that requires attention, the team sets specific targets for the project, analyses the actual performance on the subject, makes and introduces plans for change, and evaluates progress (Geboers et al., 1999).

- The organizational level (e.g., within a network that provides primary health care)

With a restricted although realistic budget, facilitation should be set up as efficiently and effectively as possible (Geboers et al., 1999).

… have a very busy schedule most of the time, leaving little or no time for extra work (Geboers et al., 2001).

It was mainly a logistics problem. We have little room in practice (Geboers et al., 2001).

We already had so many meetings and we have so many tasks to fulfill. I work in a health care center. (Geboers et al., 2001)

I have often postponed things knowingly. Sometimes the bucket just overflowed (Geboers et al., 2001).

Staying close to the needs and expectations of the practices could be a way to introduce continuous quality improvement more effectively (Geboers et al., 1999).

We also found that the available time and possibilities to plan activities well were felt to be the most important barriers to using the CQI model (Geboers et al., 2001).

- The national bureaucratic level (e.g., the Federal Office Public Health or similar administrative body)

Theories

The CQI model focuses on practitioners who identify issues that need to be improved relying on performance measurement and its analysis. This process requires leadership and self-decision at the level of practitioners.

Kinship papers: 'improving diagnostic testing'

Project Identifier: improving test ordering in the Netherlands (Verstappen et al., 2003, Verstappen et al., 2004b, Verstappen et al., 2004a, Verstappen et al., 2004c)

Topic: improving test ordering patterns in small practices

Location: Netherlands

Dates Covered: 1998-1999; publications 2003-2004

Overview

Numbers of tests taken in primary health care are increasing in many European countries. Variation between GPs is substantial. Many of the tests are unnecessary according to guidelines. False positive results may even cause harm in patients when further GPs order more invasive investigations. This randomized controlled trial tested whether a tailored intervention in pre-existing small groups affects test ordering. The study consisted of three arms: two intervention arms that served as controls for each other and a control group that only received feedback without a tailored intervention.

Objectives

The intention of this study was to evaluate whether a tailored intervention improves test ordering and whether it works better in groups than compared to feedback alone.

Context

Researchers recruited 27 small groups from different regions in the Netherlands. These pre-existing groups collaborated around their patients and served as CME groups. Group A was the intervention arm for cardiovascular diseases, upper abdominal complaints and lower abdominal complaints, B was the intervention arm for COPD/asthma, fatigue and degenerative joint

complaints and C received only feedback. A and B served as each other's control group in one paper and A and C were compared in a further paper. Finally, A and C were compared as to costs of the tests. Baseline testing was measured during 6 months and the result of the intervention after 6 months.

Intervention activities

GPs received personalized graphical feedback, including a comparison of each physician's own data with those of colleagues. Two weeks before the meeting, they also received national, evidence-based guidelines. They had three regular meetings on quality improvement in small groups. The strategy focused on specific clinical problems and the diagnostic tests used for these problems. During these three meetings, physicians were asked to discuss and compare their feedback reports in pairs in relation to the national guidelines. They also discussed Bayesian decision rules to help them understand the probability of false-positive results in disorders with low prevalence. Another topic was how to deal with the frequent requests of tests by patients. Then they discussed in pairs difficulties of implementing the guidelines in their own practice. At the end of each session, plans were drawn up for change, both at individual and group level. The process was facilitated by medical coordinators who were respected local opinion leaders

Main quantitative outcomes

The tailored intervention improved test ordering among GPs. When comparing the arm A and B, the effect size was relatively small. When comparing the tailored intervention with only feedback, the effect size was bigger. Test ordering costs could be reduced.

Main qualitative outcomes

The level of satisfaction was very high. Participants made often plans for change individually and as a group.

Main themes and propositional statements

Initiation of the programme

Explaining the method of personalized graphic feedback that was used seemed key (Verstappen et al., 2004a).

Outcome 1: addressing practitioners' needs

Mechanisms: sharing similar needs / size of group affects communication

The strategy also fts in well with the work setting of many GPs in European and non-European countries, which are often characterised by small practices, relatively isolated settings and a desire for more contacts with peers (Verstappen et al., 2004c)

The innovative, multifaceted strategy for improving test ordering behaviour was favourably evaluated by a large GP population. All local GP groups expressed a desire for continuation of the meetings after the experiment (Verstappen et al., 2004c)

GPs appreciate the combination of individual feedback, discussions about guidelines and small group quality improvement meetings driven by peer influence (Verstappen et al., 2004c).

Success rates of specific strategies seem to be strongly influenced by the extent to which they fit in with the local and organizational context and the physicians' day-today work routine (Verstappen et al., 2004a).

The first success was the easy recruitment, with practice groups eager to participate in the trial (Verstappen et al., 2004a).

Outcome 2: forming and Norming the Group

Mechanisms: need for relatedness / need for autonomy

The mean group size was 7.4 ± 2.7 (Verstappen et al., 2004c).

After a while, it may become less needed, because participants may then feel more safe about discussing their own behaviour within the group as a whole (Verstappen et al., 2004c).

Outcome 3: exchanging experiences and failures

Mechanisms: need for competence and self-actualisation

Another important topic of debate was how to deal with the frequent requests by patients to have inappropriate tests performed (Verstappen et al., 2003).

The decision to focus on clinical problems instead of tests was a good choice, since it allowed the feedback and group work to be linked to national evidence-based guidelines. GPs appreciated this approach, because it was also closely related to their everyday work routine (Verstappen et al., 2004c).

There is some empirical evidence that participating in quality circles may increase GPs' job satisfaction (Verstappen et al., 2004c).

…an important element is the focus on daily, clinical GP problems. In our study GPs preferred to talk about clinical problems and tests linked to these problems, rather than to discuss abstract phenomena like total test ordering volume or the ordering of specific tests (Verstappen et al., 2004c).

The improvement strategy concentrated on 3 specific clinical topics (cardiovascular conditions, upper abdominal complaints, and lower abdominal complaints) and the tests used for these clinical problems, because it was believed that the physicians would prefer to discuss specific clinical topics rather than specific test (Verstappen et al., 2004a).

Outcome 4: identifying learning needs, planning actions, setting priorities and goals

Mechanisms: previous knowledge is activated / cognitive dissonance

Social interactions were used as an important motivator for change, as physicians learned how colleagues were handling test ordering problems and as they obtained information about the consequences of medical decision making in daily practice (Verstappen et al., 2003).

Personalized graphical feedback, including a comparison of each physician's own data with those of colleagues; dissemination of national, evidence-based guidelines; and regular meetings on quality improvement in small groups. The strategy focused on specific clinical problems and the diagnostic tests used for these problems (Verstappen et al., 2003).

The first was mutual personal feedback by peers, who worked in pairs at the start of the meeting. This was assumed to be a safe method of peer review (Verstappen et al., 2004c).

A second important element is the fact that GPs are prepared to discuss personal, transparent data openly in a group of colleagues (Verstappen et al., 2004c).

Compared with only disseminating comparative feedback reports to primary care physicians, the new strategy of involving peer interaction and social influence improved the physicians' test-ordering behavior. To be effective, feedback needs to be integrated in an interactive, educational environment (Verstappen et al., 2004a).

…greater insights into and discussion of the physicians' own performance in a safe group of respected colleagues would be a powerful instrument to improve the quality of test ordering (Verstappen et al., 2004a).

90-minute standardized small-group quality improvement meeting about 2 weeks later at which one of the clinical problems was discussed based on the feedback reports and the guidelines (Figure 1). In these meetings social influence, which was an important vehicle to reach improvement on test ordering (Verstappen et al., 2004a).

Outcome 5: creating the learning environment

Mechanisms: social learning

… of a strategy that combines a traditional feedback strategy with a multifaceted strategy, including feedback, dissemination of and group education on evidence-based guidelines, and small group quality improvement meetings in a local primary care physicians group, using social influence as an important motivator for change (Verstappen et al., 2004b).

A multifaceted strategy combining comparative feedback on tests ordered, group education on guidelines, and small group quality improvement meetings in a local GP group, with social influence as an important motivator for change, was expected to offer good prospects (Verstappen et al., 2004c).

The second component was an interactive group education of national guidelines, to enable participants to relate their own and each other's test ordering behaviour with them (Verstappen et al., 2004c).

The new strategy utilised peer influence among GPs, and gave GPs the opportunity to openly discuss their test ordering behaviour with colleagues (Verstappen et al., 2004c).

They stated that this type of feedback definitely had added value, because comparison with colleagues made them more conscious of their own behaviour and motivated them to change. Their main criticism was the validity of the numbers of tests in the feedback and the absence of patient-related data (Verstappen et al., 2004c).

Compared with only disseminating comparative feedback reports to primary care physicians, the new strategy of involving peer interaction and social influence improved the physicians' test-ordering behavior. To be effective, feedback needs to be integrated in an interactive, educational environment (Verstappen et al., 2004a).

At these meetings, test-ordering behavior and changes in routines were discussed, using social influence and peer influence as important motivators for change. Social influence from respected colleagues or opinion leaders seems to have a greater effect on practice routines than do traditional medical education activities … (Verstappen et al., 2004a).

Many test-ordering problems that physicians encounter in everyday practice, such as demands for tests by patients and changing guidelines, can be discussed and may be solved in an open and respectful discussion among colleagues (Verstappen et al., 2004a).

Outcome 6: seeking solutions and adaptions, creating new knowledge

Mechanisms: interdependence between insurers and QCs / interdependence among group members

The physicians discussed their feedback data, and if it appeared that a physician clearly ordered fewer tests than his/her colleagues, he/she made plans for ordering more tests (Verstappen et al., 2004b).

The third was the development of individual and group plans for change, to stimulate GPs to really put their plans into daily practice (Verstappen et al., 2004c).

An example of such an individual commitment was, 'I will order fewer haemoglobin tests, because I realise that this test does not give much information in patients with vague complaints' (Verstappen et al., 2004c).

Plans at group level were also made, e.g. the plan to use the …brochure to inform patients …, or … to follow the national guideline on delaying testing in patients with vague complaints. All results show that the quality circles were an essential element in the improvement strategy (Verstappen et al., 2004c).

interactive group education in which national guidelines were related to the individual physician's actual test-ordering behavior and an effort to reach a group consensus on the optimal test-ordering behaviour (Verstappen et al., 2004a).

The personal interaction and mutual influence between colleagues implicitly resulted in an individual or group contract (Verstappen et al., 2004a).

The strategy gives physicians an opportunity to discuss their test-ordering performance with colleagues on the basis of actual performance data, making the participants feel more committed to the agreements (Verstappen et al., 2004a).

Outcome 7: systematic Use of new knowledge

Mechanisms: repetition priming and automaticity

Finally, for the same reason we were unable to assess possible learning effects, which could mean that quality activities may become less time-consuming over time, even if the approach is directed to other clinical problems (Verstappen et al., 2004b).

This schedule was repeated a year later, using the same three clinical problems, to assess whether a GP or GP group had implemented the plans for change and to initiate further improvements. This iterative aspect was another important feature of the strategy (Verstappen et al., 2004c)

In general, GPs were excited to find in the second year that they had indeed changed in accordance with their plans, and they were then usually more motivated to implement further changes (Verstappen et al., 2004c).

Our strategy also seems worthwhile because small-group quality improvement meetings can help build a local practice group focusing on quality improvement (Verstappen et al., 2004a).

Contextual levels

- The level of the individual (capabilities and motivations)
- The group level (the group and the facilitation process)

The role of the medical coordinators as opinion leaders also seems a crucial element of the strategy (Verstappen et al., 2004a).

- The organizational level (e.g., within a network that provides primary health care)

- The national bureaucratic level (e.g., the Federal Office Public Health or similar administrative body)

Theory

A structured process of audit and feedback in groups make people change behaviour.

Kinship papers: 'improvement of drug prescriptions involving pharmacists'

Project Identifier: Dutch examples of improvement of drugs prescription

(van Eijk et al., 2001, Welschen et al., 2004)

Topic: improvement of drug prescriptions for selected patient groups involving pharmacists

Location: Netherlands

Dates Covered: 1999 – 2004

Overview

Researchers used nationwide pre-existing pee review groups to promote rational drug prescribing. These small groups consisting of GPs and community pharmacists working in the same area met 5 to ten times a year for educational meetings. Van Eijk et al. (2001) compared group versus individual academic detailing, whereas Welschen et al. (2004) tested educational meetings in groups combined with training in communication skills.

Objectives

These groups met to improve the quality of drug prescribing for selected patient groups: van Eijk et al. (2001) tried to reduce anticholinergic prescription of anticholinergic drugs to elderly people, Welschen et al. (2004) tried to reduce prescription of antibiotics in upper respiratory tract infections.

Context

The Dutch Institute for Rational Drug Use supports peer review groups who focus on rational drug prescribing in collaboration with local pharmacists by since 1992. Researchers used pre-

existing local peer review groups for these studies and tested different interventions: individual feedback compared to group feedback, academic detailing combined with communication training including practice assistants compared to groups who did not receive any of these elements, and finally, joint guidelines with specialists combined with a list of strategies to overcome possible barriers when changing prescriptions.

Intervention activities

Researcher facilitators informed the participants about the evidence on prescription of specific groups of drugs and their effects on patients. Academic detailing where participants received their individual results and an opportunity to discuss the results was part of each study. Welschen et al. (2004) included communication skills training to explore patients' ideas, concerns and expectations, patient leaflets and educational training for pharmacists and practice assistants. GPs had the opportunity to discuss own patients. Facilitators intended to maintain a safe learning environment.

Main quantitative outcomes

Academic detailing was effective both in groups and at an individual level (van Eijk et al., 2001). Adding communication skills and patient leaflets to the scheme and involving other staff members seem to have an effect on prescription patterns still existing after 15 months (Welschen et al., 2004).

Main qualitative outcomes

Reducing prescription of antibiotics did not change patient satisfaction.

Main themes and propositional statements

- New stage: ***initiation of the programme***

Introduction of the model … is important for understanding and helps participants during the start of the process. It was also vital to have a common and shared understanding of the problem among participants (Welschen et al., 2004).

Outcome 1: addressing practitioners' needs

Mechanisms: sharing similar needs / size of group affects communication

… these groups of professionals practising in the same region meet regularly to discuss treatment, pharmacotherapy, and patient management (van Eijk et al., 2001).

Outcome 2: forming and Norming the Group

Mechanisms: need for relatedness / need for autonomy

…to improve antidepressant prescribing in elderly people and measure the effectiveness of an educational programme) and invited to participate in the programme (van Eijk et al., 2001).

Membership in the peer review group has been stable over time because it is unusual for general practitioners (and their patients) to switch between groups (Welschen et al., 2004).

Outcome 3: exchanging experiences and failures

Mechanisms: need for competence and self-actualisation

Outcome 4: identifying learning needs, planning actions, setting priorities and goals

Mechanisms: previous knowledge is activated / cognitive dissonance

Participants were shown the overall data on prescribing of antidepressants in the past year to illustrate that most anticholinergic antidepressants are prescribed to people aged over 60…. During the second visit a graph was provided showing personal performance (van Eijk et al., 2001).

all doctors received a summary of their group's guidelines by mail, and two months after the intervention they received the results of the baseline measurement (see outcome variables) to reinforce the consensus reached (Welschen et al., 2004).

Outcome 5: creating the learning environment

In presenting the evidence we used relative and absolute effects of antibiotics by means of the numbers needed to treat and the numbers needed to treat to harm. This discussion resulted in group consensus about indication and first choice antibiotics per disease (Welschen et al., 2004).

Our intervention—which included a group education meeting with a consensus procedure and communication skills training (Welschen et al., 2004).

Patient information included in the programme may be of help. Training in communication skills may help overcome barriers to change. Training of other staff members and involving them in the programme may improve effect since they can support the GP (Welschen et al., 2004).

Outcome 6: seeking solutions and adaptions, creating new knowledge

Mechanisms: interdependence between insurers and QCs / interdependence among group members

Groups can be more effective in accomplishing tasks,and publicly announcing behavioural changes results in more commitment than private change (van Eijk et al., 2001).

Psychological research into group behaviour has produced an inventory of factors that influence conformity with group standards. Unanimity provides more pressure to conform, while privacy makes it easier not to (van Eijk et al., 2001).

The implementation of new knowledge is facilitated by expressing and discussing how to overcome obstacles to its acceptance (van Eijk et al., 2001).

Outcome 7: systematic Use of new knowledge

Mechanisms: repletion priming and automaticity

However, other studies have shown that repeated interventions are needed for sustained behavioural changes (van Eijk et al., 2001).

Six months after the intervention, general practitioners again received feedback on their prescribing behaviour, based on insurance claims data comparing the period after the intervention … (Welschen et al., 2004).

Contextual levels

- The level of the individual (capabilities and motivations)
- The group level (the group and the facilitation process)
- The organizational level (e.g., within a network that provides primary health care)
- The national bureaucratic level (e.g., the Federal Office Public Health or similar administrative body)

Theory

Multiple intervention strategies using guidelines, audit and feedback and consensus discussions optimise prescribing behaviour.

Adult learning theory states that adult professionals want to contribute with own experiences, discuss their own problems, build on previous knowledge and learn and perform in their way (Holton et al., 2001)

Kinship papers: 'QC for guideline adherence'

Project Identifier: Dutch examples of attempts to increase guidelines adherence
(Smeele et al., 1999, Kasje et al., 2006)
Topic: guidelines adherence for chronic disease (asthma, COPD)
Location: Netherland
Dates Covered: 1999-2006

Overview

Smeele et. Al, 1999 and Kase et al., 2006 set up controlled studies to evaluate the effects of a specially developed small group education and peer review. The underlying theory was that guideline adherence improves the process and patient outcomes. Smeele et al. (1999) formed two groups of GPs and tested implementation of guidelines concerning COPD patients. Kasje et al. (2006) tested a strict procedure to improve guideline adherence.

Objectives

Smeele et al. (1999) studied the effectiveness of a peer review programme aimed at implementing guidelines on COPD/asthma in new-formed groups. Kasje et al. (2006) intended to improve prescription of drugs for diabetic patients with hypertension and patients with chronic heart failure using a strict interactive educational programme for pre-existing peer groups.

Context

In Smeele's et al. (1999) study, an experienced GP supervised group education. These were not pre-existing groups, but workshop groups organised just for this purpose. GPs were randomly allocated to one of the groups. The researchers provided one session for practice assistants with

the focus on peak flow measurement and inhalation techniques. Kasje (2006) used pre-existing peer groups who had to follow a strict programme.

Intervention activities

In Smeele's et al. (1999) study, researchers organised four sessions lasting two hours each. The facilitator used various strategies like lectures, role playing, skills training, peer review of performance, group consensus discussions, and problem solving of hypothetical situations involving patients. In Kasje's et al. (2006) study, GPs had open discussions, assessed 5 of their own patients and had to formulate their personal intentions as to these cases.

Main quantitative outcomes

Smeele et al. (1999) could not show any significant changes in practice concerning COPD patients. In Kasje's et al. study, there was a high dropout rate and the programme was not implemented as intended.

Main qualitative outcomes

Individual feedback on patient data was incomplete. Some GPs did not get any feedback at all. Educational material was incomplete and did not address barriers sufficiently. Changing treatment in stable patients was difficult. Polypharmacy and complexity of patients were barriers to additional drugs

Main themes and propositional statements

Outcome 1: addressing practitioners' needs

Mechanisms: sharing similar needs / size of group affects communication

The group education and review was done in two small groups (with nine and eight GPs, respectively) (Smeele et al., 1999).

Outcome 2: forming and Norming the Group

Mechanisms: need for relatedness / need for autonomy

Outcome 3: exchanging experiences and failures

Mechanisms: need for competence and self-actualisation

A combination of peer review and feedback aimed at clear actions appears to be the most promising approach (Welschen et al., 2004).

In most groups, there had been a discussion of the optimal treatment, as well as of barriers to change treatment in line with the recommendations of the guidelines. The idea was that by sharing experiences and learning from peers, possible solutions to perceived barriers might be offered (Welschen et al., 2004).

Outcome 4: identifying learning needs, planning actions, setting priorities and goals

Mechanisms: previous knowledge is activated / cognitive dissonance

Patient specific feedback was given by reviewing the treatment of individual patients of the participants, in contrast to other programmes that usually focus on the general management of a disease. Problems and possible solutions with changing treatment for these patients were discussed in the groups (Welschen et al., 2004).

Of the 40 GPs that reported having received individual feedback, 37 rated it as useful (Welschen et al., 2004).

For the GPs it is probably more efficient when a selection of not optimally treated patients is made for them. Such an approach has shown to increase adherence to guideline recommendations for patients with type 2 diabetes (Welschen et al., 2004).

Outcome 5: creating the learning environment

Mechanisms: social learning

...various strategies for implementing the guidelines were used: lectures, role playing, skills training, peer review of performance, group consensus discussions, and problem solving of hypothetical situations involving patients. The group education and review was done in two small groups …….) and was supervised by an experienced GP (Smeele et al., 1999).

An intensive small group education and peer review programme, which combined various strategies, was proved to influence aspects of knowledge, skills, opinions, and the presence of equipment according to the guidelines (Smeele et al., 1999).

Outcome 6: seeking solutions and adaptions, creating new knowledge

Mechanisms: interdependence between insurers or others and QCs / interdependence among group members

The barrier most often mentioned for changing the CHF treatment was related to perceived difficulties with changing treatment initiated by a specialist (Welschen et al., 2004).

Outcome 7: systematic Use of new knowledge

Mechanisms: repetition priming and automaticity

One meeting may not be enough to actually change treatment, although that is the usual procedure in the peer review groups. Behavioural theories stress the importance of repetition, especially for changing routine behaviour (Welschen et al., 2004).

Contextual levels

- The level of the individual (capabilities and motivations)

…not all GPs participated in all sessions and therefore some received only part of the information and stimuli (Welschen et al., 2004).

- The group level (the group and the facilitation process)
- The organizational level (e.g., within a network that provides primary health care)
- The national bureaucratic level (e.g., the Federal Office Public Health or similar administrative body)

Theories

A combination of reflective thinking among peers with audit and feedback was expected to change behaviour.

Kinship papers: 'Practice Based Small Group Learning (PBSGL)'

Project Identifier: Practice Based Small Group Learning

(Davis et al., 1999b, McSherry and Weiss, 2000, Peloso and Stakiw, 2000, Herbert et al., 2004, Armson et al., 2007, MacVicar et al., 2006, Kelly et al., 2007, Overton et al., 2009b, Cunningham et al., 2011, Rial and Scallan, 2013)

Topic: CME groups and behaviour change

Location: Canada, **England**, **Scotland**, **Ireland and southern England**

Dates Covered: 1999 – 2013

Overview

Starting in Canada, Practice Based Small Group Learning has a long tradition, The Foundation of Medical Practice Education built the PSBGL network in 1992 to deliver CME among GPs across the Canada. These groups meet regularly in their local areas. In 2004, PBSGL was piloted in Scotland and the groups spread rapidly across the country and to the southern parts of England. Ireland started their CME groups in 1983 and developed a well-organized network covering all counties of the country. Finally, the movement spread from Canada to the USA where insular projects were founded. The learning principles are based on PBL and the principles of adult learning. The theory states that adults are motivated for learning if the topic is relevant to their everyday professional life and if knowledge builds on previous experiences. Further, the process should actively involve participants so they can take responsibility for their own learning. Motivation increases if participants can apply new knowledge immediately. The process involves cycles of reflection and action. The process should take place in an environment of mutual trust

and respect. Postulated underlying theories are ‘transformative learning’, ‘social learning’ and the ‘adult learning theory’.

Objectives

PBSGL should encourage change of practice following a standard procedure.

Context

Groups of 5 to ten GPs meet once to twice a month for around 90 minutes. The groups choose their own topics from a list of prepared modules which are structured in a pedagogic way. Other health care professionals than GPs may sometimes attend group meetings, for instance pharmacists when participants discuss drug prescriptions.

Intervention activities

The intervention starts out with the description of a practice gap and summarizes objectives of the module. The starting point is an authentic patient case to illustrate the gap in practice. Challenging questions make GPs reflect on different approaches to own patient cases followed by an outline of guidelines with recommendations for diagnostic procedures or treatment. Comments in educational material provide possible approaches to the presented cases. The groups also use different supporting material such as algorithms, chart aids and patient leaflets. The participants’ practice experience forms the learning objectives. They achieve their learning objectives by taking up new knowledge during the process in the small group. They acknowledge obstacles to using new knowledge during this process and discuss possible solutions. Each step is triggered by reflective thinking. In the end of the meeting, they review the steps and explore their commitment to change. Then, they incorporate new knowledge into everyday practice.

Trained facilitators lead the groups. PBSGL networks offer them follow-up training on a regular basis. The facilitator creates a supportive environment and a feeling of mutual trust that allows

exchange of thoughts. Facilitators encourage participants to reflect by keeping an appropriate balance between comfort and tension in the group.

Main quantitative outcomes

Participants improved prescription habits (thiazides prescription increased) (McSherry and Weiss, 2000, Herbert et al., 2004). Participants had improved understanding of how to interpret medical evidence, improved skills in interpreting evidence, increased ability to apply evidence to day-to-day practice in an underpowered study, which could not be confirmed in England (MacVicar et al., 2006, Rial and Scallan, 2013)

Main qualitative outcomes

Participants' satisfaction was high (Davis et al., 1999b). GPs can discuss topics relevant to day-to-day practice and get access to local experts. They compare their practice with what colleagues do in similar situations. Participants experience group work and the interactive format as fun (Peloso and Stakiw, 2000). Groups of various compositions function effectively in this particular small group environment. If the facilitator lost interest or became fatigued, disintegration of the group was likely (Armson et al., 2007). The task of the facilitator is to open and close meetings, focus discussion on real practice issues and to encourage the group to identify factors that hinder implementation of new knowledge or skills. Facilitators establish a safe, supportive environment that allows discussion of medical errors or ethical issues. Facilitators encourage learning from each other They help develop a shared knowledge base and a sense of collegiality (MacVicar et al., 2006, Armson et al., 2007, Cunningham et al., 2011).

Main themes and propositional statements

Outcome 1: addressing practitioners' needs

Mechanisms: sharing similar needs / size of group affects communication

We have also arranged for CME credits, needed to fulfill the educational requirements of ongoing licensure (Peloso and Stakiw, 2000).

General practitioners can discuss topics relevant to day-to-day practice. They get access to a local expert … l. Since topics come out of their own and their peers' practices, and are discussed by the expert, it is more likely that perceived and unperceived needs will be addressed (Peloso and Stakiw, 2000).

that a small group format might be more attractive than other forms of CME, since this has been our experience (Peloso and Stakiw, 2000).

This learning format may meet a need for practices that have protected learning time to enable them to use multi-professional group learning to its full advantage (MacVicar et al., 2006).

PBSGL enabled participants to compare their practice with that of their peers, and this was mentioned frequently as a very positive motivator in joining and continuing in the groups (Kelly et al., 2007).

…with surprisingly few opportunities to gauge themselves and their practice against their peers, and they have been found to value this opportunity highly (Kelly et al., 2007).

Various members expressed a desire to keep up to date …. Others wanted to compare what they were doing with their peers, to confirm that they were practising safely …. Participants …stated that they wanted to be able to examine current evidence and to improve their critical appraisal skills (Kelly et al., 2007).

The most-cited reason for joining PBSGL … as the PBSGL format matched their preferred learning style. …. Keeping up-to-date in clinical practice was the second-most mentioned reason (Overton et al., 2009b) .

The most significant outcome did not come from the evaluative data collected during the research; rather that both groups are continuing to meet more than six months after the pilot finished (Rial and Scallan, 2013).

Outcome 2: forming and Norming the Group

Mechanisms: need for relatedness / need for autonomy

CME has focused on disseminating information, but it has become increasingly clear that acquisition of knowledge is less important in changing physicians' behaviour than the social context of learning. Habit and custom, the beliefs of peers, and social norms are the major determinants (McSherry and Weiss, 2000).

Our group usually has 12 to 15 participants, an expert, and a facilitator. We are primarily composed of generalists and family physicians, but regularly invite a pharmacist and a representative from the sponsoring pharmaceutical company (Peloso and Stakiw, 2000).

Sessions are generally held in the evenings with a meal (Peloso and Stakiw, 2000).

The need to maintain the appearance of competence may be more compelling than the need to learn. Several strategies …. First, we tried to create as relaxed an atmosphere as possible. We arranged tables in a circle, removed all barriers …, and held the sessions with a meal (Peloso and Stakiw, 2000).

We estimate it took three to four sessions for the group to be comfortable with this process. Open discussions and debates then came more freely, and the group continued to gel (Peloso and Stakiw, 2000).

The group and the interactive format are fun (Peloso and Stakiw, 2000).

The groups themselves generate topics for modules, with the subsequent module being authored by a GP (Armson et al., 2007).

Each group decided the frequency, timing and location of the meetings at the first introductory meeting. Each group also decided their preferred method for module selection (MacVicar et al., 2006).

Groups of 4 to 10 family physicians form a PBSG in their own communities, meeting for an average of 90 minutes once or twice a month at an agreed upon time and place, allowing time off for holidays and summer vacations (Armson et al., 2007).

The facilitator is selected by the group (Armson et al., 2007).

Initially, problems with group functioning were anticipated, but they are … uncommon. Groups of various compositions function effectively in this particular small group environment. … heterogeneous groups might provide broader practice experiences and greater variety in potential solutions to practice problems… (Armson et al., 2007).

The role of the facilitator has been recognised. He/she needs to be competent at many tasks including opening the discussion, clarifying, summarising, questioning, and devising strategies to improve group function (Kelly et al., 2007).

Participants liked the inclusive nature of the small groups and appreciated the egalitarian quality of the interaction within them (Kelly et al., 2007).

'It didn't matter where we came from; Skye, Wick or Brora. It soon became clear that we were all in the same learning position. And those in Inverness and Aberdeen didn't have all the answers (Kelly et al., 2007)'.

When the expert comes in, learning stops. … The use of invited experts (invariably hospital-based consultants using a traditional didactic approach to learning) was seen as an anathema to adult learning and the small-group ethos (Kelly et al., 2007).

Members of both groups described the meetings as relaxed, friendly and informal. The facilitators played a crucial role in creating the atmosphere: …, it would seem that the group members also contributed to the positive climate (Overton et al., 2009b).

Reasonably quickly I relaxed. Everybody was keen to make it a success. The group opened up and there was a sense of calm. The positive atmosphere enabled members to be open about knowledge gaps and to ask questions (Overton et al., 2009b).

The two groups appear to be at different stages of development. Group 1 seems to have developed a strong sense of cohesion quite quickly compared to Group (Overton et al., 2009b)

Interestingly, the stage of storming, which is characterized by interpersonal hostility and conflict, was not evident in either group (Overton et al., 2009b).

Norming reflects the development of group cohesion, openness and emotional support. The positive social dimension enabled the group to perform – that is, to focus on the task at hand, with resulting effectiveness (Overton et al., 2009b).

Outcome 3: exchanging experiences and failures

Mechanisms: need for competence and self-actualization

The facilitator elicited interactive responses … with the aid of specific predetermined prompting questions and responses. The program participants resolved practice-based problems …. The best practices were determined by the group as a whole and conflict resolution was achieved with the mediation of the content expert, if required (Davis et al., 1999b).

The cases were regarded as not only appropriate but also reflecting practical problems in office practice (Davis et al., 1999b).

the success of this format depends on availability of course material that reflects practice based clinical problems and on the important roles of specially trained facilitator (Davis et al., 1999b).

The ability to change practice is enhanced if skills are endorsed by trusted colleagues and supported by published literature, and there is opportunity for practice and feedback (Peloso and Stakiw, 2000).

Since learners are involved in providing the topics, motivation is high and relevance to clinical practice is obvious. The format is highly interactive and readily allows for peer to-peer discussion (Peloso and Stakiw, 2000).

11/2- to 2-hour discussion period follows, in which one or two of our GP learners will present a case from their practice on the topic (Peloso and Stakiw, 2000).

Group members prepare cases from their office and present them in 3 to 4 minutes, to set the stage for discussion. …, we actively solicited group participation throughout the session. This encouragement was a major function of the facilitator early on (Peloso and Stakiw, 2000).

Virtually everyone participates in presenting a case, asking for advice or clarification, or describing their practice patterns (Peloso and Stakiw, 2000).

General practitioners can discuss topics relevant to day-to-day practice (Peloso and Stakiw, 2000).

Participants were encouraged to bring their own cases in relation to the topic. In this group, members were given tasks at the end of the meeting and fed back on these at the next meeting (MacVicar et al., 2006).

What have you gained from participating in this practice-based small group learning project' – small group support: the group works effectively together and as time progressed I was able to participate more effectively as my confidence grew (MacVicar et al., 2006).

…. particularly when they involve participation in small peer groups that foster trust, promote discussion of evidence relevant to real cases and provide feedback on performance (Armson et al., 2007),

One objective of the PBSG program is to encourage physician members to reflect on their individual practices and identify any gaps between current practice and the best available evidence. This is accomplished through discussion of real-life medical and patient problems in small groups of peers (Armson et al., 2007).

The theoretical basis for changing practice begins with the individual physician's experience of patient care (Armson et al., 2007).

PBSG modules are designed to engage family physicians "in learning activities that are self-directed and related to authentic practice problems.... The cases, linked with important information, are the keys to stimulating discussion around patient care issues (Armson et al., 2007).

An interactive small group can prompt moderately large changes in physician practice (Armson et al., 2007).

Exposure to the experiences and uncertainties of trusted colleagues could also enhance the accuracy of physicians' self-assessment. Given the inaccuracy of physicians in assessing personal practice gaps, this collegial interaction can be pivotal in focusing the desire for competence that precipitates practice change (Armson et al., 2007).

The use of a case-based format encourages activation of previous knowledge, allowing better retrieval of knowledge in the clinical setting (Armson et al., 2007).

The aim is not to solve the presented problems, rather the problems should act as a stimulus to encourage the group members to identify, discuss and address cases from their own experience too (Kelly et al., 2007).

The purpose is to enable the transfer of evidence into practice through the use of facilitated small groups, using presented cases to encourage reflection on individual practice (Kelly et al., 2007).

PBSG enabled participants to compare their practice with that of their peers, and this was mentioned frequently as a very positive motivator in joining and continuing in the groups. This corroborates previous work which found this to be an enhancer for translating research into practice (Kelly et al., 2007).

…comparison with one's peers was important, as was the support, confidence and reassurance that some gained from being part of the group (Kelly et al., 2007).

I've gained more confidence because of spending time with these people. To go in [to PBSGL meetings], be with these fellow professionals, but it was completely calm, completely non-judgemental (Overton et al., 2009b).

Outcome 4: identifying learning needs, planning actions, setting priorities and goals

Mechanisms: previous knowledge is activated / cognitive dissonance

There also must be some motivation for learning and change: this can be ensured if the issues discussed are derived from the learner's own clinical practice (Peloso and Stakiw, 2000).

it provides an opportunity to measure one's practice against that of one's peers. Direct, extended interaction with a local recognized (Peloso and Stakiw, 2000).

Since topics come out of their own and their peers' practices, and are discussed by the expert, it is more likely that perceived and unperceived needs will be addressed (Peloso and Stakiw, 2000).

It is a relaxed, enjoyable evening in a friendly environment. .... This exchange allows for clarifications and redirections, leading to learning for both GP and expert. It is also an opportunity for the expert to learn of the tremendous competence that exists within GP practice (Peloso and Stakiw, 2000)

Of greatest importance to GPs is the opportunity to measure their current practice patterns against that of their peers (Peloso and Stakiw, 2000).

We recognize that many personal, professional, and social forces affect attendance at CME beyond the format itself (Peloso and Stakiw, 2000).

Individualized feedback with specific recommendations, especially when combined with education, generally have been more effective than single intervention (Herbert et al., 2004).

One objective of the PBSG program is to encourage physician members to reflect on their individual practices and identify any gaps between current practice and the best available evidence. This is accomplished through discussion of real-life medical and patient problems in small groups of peers (Armson et al., 2007).

Through reflection, a gap between current practice and best practice is recognized. Distinguishing this gap presents an opportunity to identify learning objectives specific to the family practice setting (Armson et al., 2007).

Physicians who received feedback about personal prescribing or who used the PBSG process to discuss hypertension were more likely to change their prescribing than physicians in PBSG who reviewed a different condition. When feedback about personal prescribing was combined with the PBSG process, the effect ... was even greater (Armson et al., 2007).

Network (SIGN) on a variety of clinical and non-clinical topics. 'Modules are much better than SIGN guidelines because they are patient based and make you think about your own practice (Kelly et al., 2007).

Cranney also identified some barriers to translating evidence into practice including: doubts about the applicability of data to particular patients, ageist attitudes and the absence of an educational mentor (Kelly et al., 2007).

Outcome 5: creating the learning environment

Mechanisms: social learning

Either the facilitator or the expert is asked to recommend one or two relevant articles to follow up the discussion. The expert has frequently selected an article in advance, from knowledge of frequently asked questions in prior learning environments (Peloso and Stakiw, 2000).

…the group selects topics, directs the agenda, points out inappropriate comments or inappropriate practices in a constructive manner, and also leads group members back on topic. The conversation is free-flowing and highly interactive (Peloso and Stakiw, 2000).

The group encourages other points of view to establish practice norms. This allows individual GPs to see where they may deviate from usual standards of care (Peloso and Stakiw, 2000).

What have you gained from participating in this practice-based small group learning project – learning from colleagues: the group discussion allowed us to share our experience and management of various problems (MacVicar et al., 2006)?

Group discussion allows for sharing of experiences and of thoughts about strategies for implementing practice changes and about overcoming anticipated barriers (Armson et al., 2007).

Learning from and with colleagues is an important source of both new information and strategies for applying that information to practice (Armson et al., 2007).

When there are great obstacles to change (eg, limited time, the need to acquire a new skill), the group might decide to set aside time to specifically address strategies for overcoming these barriers (Armson et al., 2007).

a structured tool for promoting reflection on the topic discussed at the group meeting and for identifying plans for practice change. The commitment-to change section of the log sheet appears (Armson et al., 2007).

… participants stated that they had applied some learning to their practice. They reported a general increase in awareness of conditions and also confidence in treating them (Kelly et al., 2007).

…discussion of personal stories might help participants tackle any doubts they may have on individual cases, and it might also enable attitudes to be highlighted and perhaps modified, through hearing the views and beliefs of others. …, the group members and the facilitator may … offered each other educational support (Kelly et al., 2007).

Most GPs and PNs valued learning together. Several GPs from Group 1 said that they were consistently satisfied with the learning that took place in their group (Overton et al., 2009b).

I think there is a mutual keenness to learn from each other (Overton et al., 2009b).

A ‘‘mutual keenness’’ to learn from and about each other emerges as a crucial ingredient for learners to feel that their learning needs were being met given the multi-professional context (Overton et al., 2009b).

'Learning from colleagues' (three comments) 'Has been very constructive and helpful (Rial and Scallan, 2013).

to work through cases together and massively furthered my learning.' 'Really useful (secondly) discussion with colleagues/peers regarding management of conditions in real practice (Rial and Scallan, 2013).

Outcome 6: seeking solutions and adaptions, creating new knowledge

Mechanisms: interdependence between insurers and QCs / interdependence among group

members

1986 study showed that physicians implemented 50% of the practice changes they reported intending to make as a result of participating in a CME program (McSherry and Weiss, 2000).

…a learner-directed agenda of topics, presentation of information by trusted peers or local experts, and opportunity for practice and feedback. If the information comes from several sources—…—the perception of need for and the durability of change are enhanced (Peloso and Stakiw, 2000).

Within the group, members endeavour to identify specific barriers to these practice changes and to formulate implementation strategies to facilitate desired changes (Armson et al., 2007).

The acquisition of new knowledge, skills, and approaches to bridge this gap follows. Often, however, access to new information alone is not sufficient. Reflection and discussion are necessary to help physicians 1) identify areas where current practice requires change and 2) develop strategies to integrate this new approach (Armson et al., 2007).

Commonality and differences between local practices. Some participants commented that listening to ''how peers work'' was a benefit: Finding out what everybody is doing locally . . . it makes you think 'would that be better… (Overton et al., 2009b).

New: Creating and testing new knowledge

Innovative solutions to clinical problems can be shared, and nonstandard methods are highlighted in a nonthreatening way (Peloso and Stakiw, 2000).

…, in some situations, evidence may not exist or local experts may disagree with the evidence. The facilitator can help by reinforcing the tenets of evidence-based medicine, by selecting methodologically sound overviews …, and by asking the expert to address any evidence that exists for the recommendations made (Peloso and Stakiw, 2000).

Interactive approaches, however, can be effective, particularly when they involve participation in small peer groups that foster trust, promote discussion of evidence relevant to real cases, provide feedback on performance, and offer opportunities for practising newly learned skills (Armson et al., 2007).

… new knowledge is … facilitated through the "... working with it, discussing it, and connecting it with what is … known…. because physicians … generate … 1 question for every 2 patients … the opportunity to explore these questions in …groups can stimulate … ideas for future change (Armson et al., 2007).

It is known that small groups can encourage active participation and deep learning as well as learning of group skills and the ability to express new ideas (Kelly et al., 2007).

Understanding application of new knowledge. The discussions helped members to consider translating evidence into practice: Sometimes you can read about things but are unable to see how to put it into practice and I feel PBSGL enables you to think how you can do that (Overton et al., 2009b).

Outcome 7: systematic Use of new knowledge

Mechanisms: repetition priming and automaticity

Contextual levels

- The level of the individual (capabilities and motivations)
- The group level (the group and the facilitation process)

Facilitators …. trained …. over approximately 20 training hours. Facilitators provided … opportunity for all participants to ask questions …. We … encouraged participants to discuss their …practice patterns. The facilitator …redirected conversations that moved off topic, calmed the skeptics, and encouraged quieter participants to share their personal experiences (Peloso and Stakiw, 2000).

In the mature group, the facilitator's major role is to introduce the expert to the group and the process, and to provide some closure at the end of the meeting (Peloso and Stakiw, 2000).

… tasks of the facilitator are to focus discussion … to encourage the group to identify factors that ... hinder implementation of new knowledge … …. To successfully fulfil this role, facilitators ...establish a safe, supportive environment ... identify practice gaps and encourage the discussion of sensitive ... issues (Armson et al., 2007).

The role of the facilitator has been recognised.5 He/she needs to be competent at many tasks including opening the discussion, clarifying, summarising, questioning, and devising strategies to improve group function (Kelly et al., 2007).

There was widespread agreement that the principal requisites for a good facilitator were experience and competence in small-group skills. One facilitator identified another skill: 'You've got to be able to hold the tension between comforting and challenging (Kelly et al., 2007).

The facilitators were also skilled in encouraging participation (Overton et al., 2009b).

'I think you need a facilitator certainly need it for the donkey work of the, arranging the meeting and making sure everybody has the module (Cunningham et al., 2011).

'It gives you licence to play devil's advocate as well and challenge people a bit more whereas if you were always doing that as just a group member, people might think you were just doing it to annoy them (Cunningham et al., 2011).

- The organizational level (e.g., within a network that provides primary health care)

Participants considered that one-to-one mentorship with an experienced or established PBSGL facilitator would be very beneficial. This was also suggested as a method to encourage members of existing groups to train as facilitators (Cunningham et al., 2011).

Any anxieties that potential facilitators may feel, mainly the concern that a new group will be hard to form, or will be dysfunctional, – need to be discussed with potential facilitators before and during the initial training. Facilitators of such groups will need the most support … (Cunningham et al., 2011).

In countries using PBSGL, national networks provide training for facilitators and supporting material for the groups (Armson et al., 2007).

- The national bureaucratic level (e.g., the Federal Office Public Health or similar administrative body)

Theories

Transformative learning starts out with a disorienting dilemma when reflecting followed by self-investigation with feelings of guilt or shame. A critical evaluation of assumptions takes place. During this process, participants feel dissatisfied but appreciate that other people have also mastered a similar challenge. A search for options for new roles, relationships and actions starts and a course of action is planned. First, you have to acquire knowledge and skills to implement the plans and try out new roles. Skills are developed and confidence increases to take on new roles. Finally, you can resume your usual practice, which has changed (Mezirow, 1997).

In short, transformative learning is a conscious process that starts with a dilemma leading to solutions through critical reflection.

In *social learning*, people learn not only through behavioural consequences but also through observation. In this way, the experiences and knowledge of others can be passed on to others. In contrast to classical and operant conditioning, completely new knowledge can be learned by studying a model (Bandura and McClelland, 1977).

Adult learning theory states that adult professionals want to contribute with own experiences, discuss their own problems, build on previous knowledge and learn and perform in their way (Holton et al., 2001)

Principles of adult learning (MacVicar et al., 2006)

Adults are motivated by learning that: - is perceived as relevant is based on, and builds on, their previous experiences is participatory and actively involves them is focused on problems is designed so that they can take responsibility for their own learning can be immediately applied in

practice involves cycles of action and reflection is based on mutual trust and respect

Kinship papers: 'deutsche Qualitätszirkel'

Project Identifier: Quality Circles in Germany

Topic: initiation, development and evaluation of QCs in different areas in Germany supported by association of statutory health insurance and AQUA (Quality in Health Care) (Szecsenyi et al., 1994, Gerlach et al., 1995, Hartmann et al., 1995, Tausch et al., 1995, Tausch and Harter, 1996, Andres et al., 1997, Murad, 1998, Beyer et al., 1999, Tausch and Harter, 2001, Aubke et al., 2003, Beyer et al., 2003, Andres, 2004b, Andres, 2004a, Wensing et al., 2004, Mols et al., 2005, Fessler et al., 2006, Papendick et al., 2006, Vollmar et al., 2007, Schneider et al., 2007, Vollmar et al., 2009, Wensing et al., 2009, Andres et al., 2010, Vollmar et al., 2010, Siebolds et al., 2012)

Location: Germany

Dates Covered: 1994 - 2012

Overview

In Germany, all accredited physicians must belong to an association of statutory health insurance corporation. They are responsible for providing care for members of the statutory health insurance funds. From the very beginning, these organisations have actively supported the establishment and evaluation of QC. The Federal Association of Statutory Health Insurance Physicians is the umbrella organisation of the 17 corporations covering all parts of Germany and coordinates QC activities at a national level. The methods and organisation of these quality circles have been elaborated since their development in the early 1990s by the AQUA (Quality in Health Care) institute. QCs were piloted and tested in different regions of Germany. QCs techniques were further developed and facilitators received manuals as a support in the process. In the next phase,

AQA evaluated QCs' performance concerning prescription patterns time and again in different states. Finally, facilitators received special attention concerning training and continuing support.

German QCs are based on the principle of cooperative learning where participants have a shared understanding of a problem and find a common solution to a problem. Their QCs relate strongly to everyday practice where all participants experience the same situation. Patient perspectives and colleagues' clinical considerations result in confrontation between how you look at your practice compared to other perspectives. Professional and emotional support from colleagues' help implement new expertise. Exchange of experiences helps participants understand the particularities of general practice and allows a transfer of knowledge.

Objectives

German QCs provide opportunities for CME/ CPD and QI. The groups may choose their topics themselves and improve practice organisation, working conditions, drug prescriptions or diagnostic habits. Facilitators may use provided manuals for guidance.

Context

Groups of 6-15 health care professionals meet at regular intervals under the guidance of a trained facilitator. As there are other specialities than GPs who are working in German primary care, there may be other staff members such a psychologist, psychiatrists or practice assistants who attend QCs.

Intervention activities

A steady group of physicians and sometimes other health care professionals meets at regular intervals to consider their standard practice. Their work is based on own experiences. They work target-oriented to promote quality in their own practice. Sources of data are own cases and data from own medical records, statistics about patient referrals. Other sources are only of minor importance. Peer lead academic detailing allows comparison with colleagues, promotes reflective thinking and consensus discussions about decisions that are not in line with evidence-based

material. A protocol is written after each QC. Iterative presentation of own data in meetings at regular intervals is important for behaviour change.

Main quantitative outcomes

Mirroring prescription data and giving continuous academic detailing improves GPs' performance (Andres et al., 1997, Andres, 2004b, Andres, 2004a, Wensing et al., 2004, Fessler et al., 2006, Papendick et al., 2006, Wensing et al., 2009). Guideline adherence could not be statistically improved over several studies (Hartmann et al., 1995, Murad, 1998, Mols et al., 2005). Tailored feedback with benchmarking does not seem to improve performance compared regular tailored feedback but decreased GPs' satisfaction with the process (Schneider et al., 2007)

Main qualitative outcomes

QCs met health care professionals needs (Szecsenyi et al., 1994, Gerlach et al., 1995). Exchange among colleagues is the most important reason for participating in QCs followed by increase of self-confidence in everyday practice and improved communication skills. QCs were associated with a positive learning experience and high level of satisfaction (Tausch et al., 1995, Tausch and Harter, 1996, Tausch and Harter, 2001). GPs favour learning environments such as discussion of scientific articles, exchange of experiences among colleagues, and discussions and debates in QCs. E learning only plays a minor role (Vollmar et al., 2009, Vollmar et al., 2010)

Main Themes and Propositional Statements

- New stage: ***introduction***

In September 1992, 200 general practitioners and internists of a defined postal code area were contacted by the Kassel district office of the Kassenärztliche Vereinigung Hessen and invited to an information event [translated from German] (Szecsenyi et al., 1994).

It might be better to provide targeted information in advance of the project at an information event. This would make it easier for potential participants to decide for or against participating in the project, since questions as well as fears and reservations can be clarified immediately [translated from German] (Andres et al., 1997).

Surveys have revealed far-reaching gaps in information, some of which are the cause of misunderstandings and misjudgements. In particular, the working methods and objectives of medical quality circles are apparently insufficiently known. Better general information on this subject, which contracted doctors in particular, expect from their KV (health insurance company), is therefore urgently needed. As examples from the Netherlands and Great Britain show, active information from the target group is a basic prerequisite for quality-enhancing measures in practice [translated from German] (Beyer et al., 1999).

Outcome 1: addressing practitioners' needs

Mechanisms: sharing similar needs / size of group affects communication

The reasons for participation varied and ranged from overcoming the lone fighter situation in the practice, defining the image of the family doctor, possibilities and limits, to searching for practical solutions to everyday treatment problems [translated from German] (Szecsenyi et al., 1994).

The most frequently mentioned motives for participating in quality circles were practical help and exchange of experience (57 and 58 mentions) [translated from German] (Gerlach et al., 1995).

Specific assistance and solutions for actual problems in their own practice are sought and willingly accepted. Finally, a decisive factor for the motivation to work in the case-oriented QZ is the emotional relief reported by all participants [translated from German] (Gerlach et al., 1995).

The vast majority of participants cite the collegial exchange of experience as the greatest motivating factor for working in a quality circle. The primary goal is to improve the collegial relationships. At the same time, the desire for more consensus in medical action and the improvement of skills in diagnostics and therapy is mentioned as a very important objective [translated from German] (Tausch and Harter, 1996).

The main motives for participating in quality circles were the expectation of practical help for one's own practice, inter-collegial exchange of experience, improvement of patient care and opportunities for self-reflection on one's own work as well as personal support. Competing time commitments and above all the fear of external controls were mentioned as obstacles to participation in quality circles [translated from German] (Beyer et al., 1999).

Quality assurance in outpatient care was considered necessary - even more so in Saxony-Anhalt than in Bremen [translated from German] (Beyer et al., 1999).

The summary makes it clear that the question of participation in a quality circle is primarily based on specific medical needs. Many physicians wish to receive practical assistance in their daily practice and wish to overcome the structurally dependent professional and emotional isolation through intercollegial exchange. The most important goal is therefore personal support [translated from German] (Beyer et al., 1999).

Overall, more than 86% of the participants were (very) satisfied with the work in the quality circle. In contrast, only 2.8% were dissatisfied and 0.4% very dissatisfied [translated from German] (Andres, 2004a).

For almost all participants (97.1 percent), the desire to analyse their own prescribing behaviour and to optimise it with the help of the prescription data evaluation of colleagues was at the top of the list. The exchange of experience with colleagues and the expansion and refreshing of knowledge regarding pharmacotherapy were also considered important [translated from German] (Andres, 2004b).

The same publication points out that GPs – due to the lack of therapeutic consequences – do not seriously wish to diagnose the illness (Vollmar et al., 2007).

Data from older surveys showed that family physicians indicated colleagues most often as information sources, followed by journals and books…. The most important requirements for media in medical education as perceived by the participants were its relevancy for daily practice and dependability (Vollmar et al., 2009).

… analysis of the GPs preferences for educational media … we … predict that German general practitioners … favour the "classical" learning environments such as: journals, colleagues, and quality circles. journals and books. … exchange ideas and discuss actual trends with colleagues collegial and interactive rather than to meet experts … (Vollmar et al., 2009).

How can QCs be supported? (Table 2) Group sizes > 15 or < 5 - are problematic and participants need support [translated from German] (Andres et al., 2010).

Outcome 2: forming and Norming the Group

Mechanisms: need for relatedness / need for autonomy

The group established common criteria for carrying out an inventory of needs using a standardised form of documentation of the QC process [translated from German] (Szecsenyi et al., 1994).

Specific assistance and solutions for actual problems in their own practice are sought and willingly accepted. Finally, a decisive factor for the motivation to work in the case-oriented QZ is the emotional relief reported by all participants [translated from German] (Gerlach et al., 1995).

The objectives of achieving greater flexibility and more enjoyment in medical practice through quality circle work are also emphasised (Tausch and Harter, 1996).

This (negative) assessment (of QC work) could be an expression of resistance and reservations regarding the background of the project and gaining participants, and thus an implicit plea for voluntariness and self-determination as the most important characteristic of medical QC [translated from German] (Andres et al., 1997).

The basic message was that quality circles are necessary because they promote collegial cohesion more intensively than normal training events. It is extremely important for the individual to know that their colleagues share the same problems or experiences that he or she has [translated from German] (Murad, 1998).

The second key area of expectation was with the promotion of collegial exchange: more than conventional further-training events, quality circles assumed that a special form of group work by doctors would be a way of overcoming isolation in the private practice [translated from German] (Beyer et al., 1999).

The main focus of our analysis is on the characteristics of successful quality circle work that can be derived from theory, as they are also laid down in the above mentioned quality assurance guideline: group constancy and continuity, experience-based work on self-chosen topics, collegial group climate and goal orientation towards quality promotion in one's own practice [translated from German] (Andres et al., 2010).

An average of 10 doctors took part in a quality circle meeting lasting 144 minutes on average. The average attendance rate at the individual meetings is over 75% (Andres et al., 2010).

The vast majority of the meeting time (over 80%) is used for topic-related work, 11% is used for inter-collegial, also professional-political exchange, only 2 or 3% of the meeting time is used for formalities or the discussion of group-related content (Andres et al., 2010).

Outcome 3: exchanging experiences and failures

Mechanisms: need for competence and self-actualisation

It became clear that one's own actions are influenced less by the appropriate clinical knowledge than by one's own experiences, attitudes, and interaction with patients [translated from German] (Szecsenyi et al., 1994).

Each participant described his or her own case of how a family doctor deals with their own sore throats or family members' complaints [translated from German] (Szecsenyi et al., 1994).

The possibility of overcoming isolation in one's own practice, a way out of isolation, as well as the experience that others have similar problems structurally and they are not different from anybody else, seems an emotional relief. Even more, the reawakening that medical action (e.g. active listening to blood pressure measurement) can be helpful and positive [translated from German] (Gerlach et al., 1995).

Through the joint exchange of experience between quality circles, the special features of family medicine can be identified and clarified, thus allowing for an improved transfer of knowledge (Tausch and Harter, 1996).

By working within a QC, I have received more emotional support for my daily practice. The QC work should offer help with disputes/arguments and emotional relief when, comes to, for instance, very expensive therapies [translated from German] (Andres et al., 1997).

The basic message was that quality circles are necessary because they promote collegial cohesion more intensively than normal training events. It is extremely important for the individual to know that their colleagues share the same problems or experiences that he or she has [translated from German] (Murad, 1998).

During discussions at the level of relationships (case discussion), the exchange is more intense than in the exchange of pure facts; one's own behaviour is better analysed and suggestions for training in one's own practice came up [translated from German] (Murad, 1998).

In each session, a colleague presented a difficult clinical case, which was discussed in the group according to a clearly structured manual, they sought solutions together and in the final phase, the group suggested a new treatment plan, which the presenting colleague had to try to implement in his practice [translated from German](Murad, 1998).

....it would be easier to conduct a conversation (e.g. when dealing with desired prescriptions); a topic that is always relevant for different indication areas and where many people seem to have benefited from the exchange of experiences and the group discussion. Probably, they felt strengthened by the support from colleagues and the enhanced self-image as GPs [translated from German] (Andres, 2004a).

Concept A consists of a structured case discussion study within the GPs' quality circle, moderated by a trainer. Participants are required to prepare independently beforehand by attending e-training sessions at a designated Internet site ("blended-learning" approach) [translated from German] (Vollmar et al., 2007).

A systematic procedure ...: data in the feedback report were studied ..., reasons for variation were discussed, ... prices of drugs, evidence underlying drug treatment was considered, typical patient cases from practice were analysed and finally objectives for improvement were formulated, and specific plans for improvement were made (Wensing et al., 2009).

One of the key features of QCs is that working methods map the quality of care in one's own practice. First of all, this distinguishes QC work from further training in the classical style and second, it enables participants to identify real quality problems in their own practice [Translated from German] (Andres et al., 2010).

....in the sense of a continuous, systematic, goal-oriented, facilitated exchange of experience on the basis of specific everyday actions in practice [translated from German] (Andres et al., 2010).

New mechanism: if practitioners discuss clinical cases, then experience based knowledge

becomes explicit, because when they talk about experiences implicit knowledge becomes explicit

By dealing with actual clinical cases, real difficulties in the participants' everyday practice become the subject of discussion in the quality circle instead of constructed problems. In systematic reconstruction, participants make the experiences conscious, so that intuitively applied - implicit guidelines can be made explicit [translated from German] (Gerlach et al., 1995).

Outcome 4: identifying learning needs, planning actions, setting priorities and goals

Mechanisms: previous knowledge is activated / cognitive dissonance

This should not be done schematically according to a fixed schedule, but rather with the help of various methods that reflect the reality of everyday practice (e.g. case discussions, file card analysis, documentation with a study character, video, etc.). They can also be used in parallel [translated from German] (Szecsenyi et al., 1994).

With regard to taking a practical assessment of their own actions, some participants feared that they would only be burdened with additional work, but on the other hand they were also very curious to see what we were doing [translated from German] (Szecsenyi et al., 1994).

A case-related approach offers the opportunity to confront learned normative expertise and concrete actual action in one's own practice.....By comparing one's own perceptions and the viewpoints of other circle members, as well as by confronting assumed and real actions, e.g. by analysing video recordings, individual and collective defence strategies can become conscious. The deviations from one's own normative expertise and thus the problem of the implementation of existing theoretical knowledge into everyday practice become accessible for analysis [translated from German] (Gerlach et al., 1995).

A basic problem of continuing medical education is the well-known mismatch between individual, existing specialist knowledge and putting this knowledge into everyday practice.....Quality circles as a form of QI, which among other things also serves the purpose of continuing medical education, can improve this situation [translated from German] (Gerlach et al., 1995).

On the basis of documentation of one's own activities in daily practice (e.g. in the form of index card evaluations, video recordings, EDP extracts, documents that one has created oneself, etc.), it is possible to learn from your own actions [translated from German] (Gerlach et al., 1995).

They (the modules) are didactically structured in a way that allow comparisons of systematic processes with the actual procedures in practice. This stimulates the participants and the principle of cooperative learning can be realised.... The participants should identify, name and document deviations from their medical actions. This also includes checking whether documentation and data material is available [translated from German] (Tausch and Harter, 1996).

The aim of the project was to make doctors' own prescription behaviour transparent and to highlight problem areas [translated from German] (Andres et al., 1997).

Presentation of these predefined guidelines was meant to encourage the participating doctors to assess their own performance and to foster discussion and refinement of the moderator-manuals (Aubke et al., 2003).

GPs see QCs on pharmacotherapy as a sensible and useful measure for optimizing their own prescription methods. They regard part 1 of the prescription mirror as the most important instrument of the quality circle work (i.e.: the feedback of one's own, specially prepared prescription data with the possibility to compare oneself with colleagues of the project group as well as a GP control group without intervention) [translated from German](Andres, 2004a).

[Why Guidelines do not work:

In general, efforts are being made to improve practice performance by developing guidelines. Guidelines are intended to help general practitioners to tailor the care of individual patients to generally accepted scientific findings. However, guidelines are not sufficiently implemented. The reason for this is probably the lack of practicability and low relevance of the guidelines for family doctors. In addition, they give general practitioners too little room for their own medical decisions [translated from German] (Mols et al., 2005).

Quality circles comprise a practice-base strategy to improve professional performance, which is based on meetings in small groups of health professionals, provision of evidence-based information, written feedback on professional performance and exchange of best practices in improving patient care (Wensing et al., 2009).

… impact of physicians' views on the use of performance feedback, indicators and price comparisons. This set of views reflects both a willingness to reflect critically on one's professional performance and a positive attitude regarding the ideal of evidence-based medicine (Wensing et al., 2009).

The intervention comprised of quality circles of primary care physicians, including repeated feedback on prescribing patterns … nine small group sessions in which the feedback, guidelines on appropriate prescribing and exchange of best practices in changing performance were discussed…… The report included evidence-based information on prescribing in targeted conditions (Wensing et al., 2009).

What sources of information were used? Still considered a "classic", the oral case presentation was by far the most frequently used source of information in 56.2% (=15,313 meetings). Other methods such as index cards, note sheets, data from electronic medical records were used significantly less frequently (20%) [Translated from German] (Siebolds et al., 2012)

Outcome 5: creating the learning environment

Mechanisms: social learning

At the same time, our concept leaves room for case-related and problem-oriented learning using our own patient examples from practice [translated from German] (Tausch et al., 1995).

They (the modules) are didactically structured in a way that allows comparison of theoretical approaches with the actual procedure in practice and so the principle of cooperative learning can be realised [translated from German] (Tausch and Harter, 1996).

The principle of cooperative learning in the quality circle (everyone learns from everyone else) leads to increased flexibility and more pleasure in practice [translated from German] (Tausch and Harter, 1996).

Almost 73 % of the participants thus confirm that the intercollegial exchange in the Pharmacotherapy Quality Circle - as in all other quality circles (10-12) - can be regarded as one of the fundamental mechanisms of action [translated from German] (Andres, 2004a).

They particularly appreciate the opportunity to compare their own prescribing behaviour with that of their colleagues and to discuss it in the familiar setting of a small group. In addition to this intrinsic principle of quality circles of intercollegial, equal and non-hierarchical exchange in a familiar group (of so-called "peers"), the feedback of one's own prescription data with the possibility of comparing oneself with other colleagues and to measuring one's own progress in the context of a before-and-after comparison (evaluation) contributes significantly to the success of the project [translated from German] (Andres, 2004a).

Especially the expectation of a successful collegial exchange of experiences, which was most frequently mentioned at the beginning of the project, seems to have been fulfilled: The vast majority of participants emphasised that they had received helpful tips from colleagues who had helped them to implement changes [translated from German] (Andres, 2004b).

The quality circle concept assumes intrinsic motivation of doctors to improve their professional performance through interactive learning activities with colleagues, as described by Bahrs et al. (2001) (Wensing et al., 2004).

Regular ... reflection on common practice with other colleagues. ... individual feedback, ... discussed in the group under the guidance of a moderator ... benchmark activities… The core element of these circles is the conjoint discussion of evidence-… and management of patients on the basis of prescribing data… (Schneider et al., 2007).

… an important component of the improvement strategy is an individual learning activity: reading and reflecting on the written feedback reports. This is consistent with insights from educational research, which showed that …. learning activity is an important predictor of the effectiveness of any educational programme for professionals (Wensing et al., 2009).

Outcome 6: seeking solutions and adaptions, creating new knowledge

Mechanisms: interdependence between insurers and QCs / interdependence among group members

The decentralised approach at the local, internal level consists of collecting available knowledge from the everyday practice of the medical participants and formulating a workable consensus from this. The advantage of this method is that the physicians are actively involved in this process and are more motivated to implement the developed guidelines. In addition, this results in a stronger commitment and acceptance by the participants [translated from German] (Tausch and Harter, 1996).

The programme for the meetings was based on principles of quality improvement, which implied that a systematic procedure was followed: themes were selected, objectives were formulated, plans for improvement were made and implemented and changes were evaluated (Wensing et al., 2004).

The physicians in the Rhine-Main network of physicians committed themselves to participating in QCs when they joined the contract. In QCs, they discuss prescription patterns for specific clinical situations and adapt (guidelines) to local conditions [translated from German] (Papendick et al., 2006).

In more than 90% of the meetings, new health care aspects could be identified according to the facilitators' assessment [translated from German] (Andres et al., 2010).

For only just over 4% of the meetings (n=1,150 meetings) the facilitators indicated that no agreement could be reached (Andres et al., 2010).

Facilitators ensure that participants not only focused on a specific topic, but also focus on their own actions in their own practices and that they identify blind spots in their daily work. Approximately 90% of the methods used are certified as having been able to reveal previously unknown aspects of care [translated from German] (Andres et al., 2010).

Outcome 7: systematic Use of new knowledge

Mechanisms: repetition priming and automaticity

This should not be done schematically according to a fixed schedule, but rather with the help of various methods that reflect the reality of everyday practice (e.g. case discussions, file card analysis, documentation with a study character, video, etc.). They can also be used in parallel [translated from German] (Szecsenyi et al., 1994).

The benefit from participation depended significantly on the frequency of the meetings. Real improvements to performance in daily care can only occur if there is an ongoing and regular quality circle process (Aubke et al., 2003).

Suitable data illustrate everyday practice. Participants formulate and discuss possibilities for improvements within the collegial framework of the quality circle and implement these in a further step in their own practice. Renewed data collection then allows them to observe effects of the implemented measures and gain confidence. The results are input for a new discussion in the quality circle [translated from German] (Andres, 2004b).

The intervention comprised repeated feedback on prescribing routines and an intensive programme of educational small group sessions, as described by Bahrs et al. (2001) (Wensing et al., 2004).

Assuming a straightforward dose–response relationship, it was expected that the groups were most effective when physicians participated in most sessions. Stronger effects were also expected, if the groups comprised of physicians who had more experience with learning in small peer groups … (Wensing et al., 2009).

The quality circles (N=1,241) documented an average of 22 meetings (mean value: 21.96) (range: by definition min. 4, max. 127 meetings [translated from German] (Andres et al., 2010).

Contextual levels

- The level of the individual (capabilities and motivations)
- The group level (the group and the facilitation process)

Our group prepared the facilitators for their task in two one-day training sessions. They had to conduct a model quality circle and critically discuss their role based on a pre-developed manual. In the second training course, we taught them important basic knowledge of group dynamics and basic didactic skills for their role as a facilitator [translated from German] (Tausch et al., 1995).

1-2 doctors from each group took on the task of the facilitation. AQUA employees trained and supported them during the course of the project. They also prepared facilitation materials and provided organisational support [translated from German] (Andres, 2004a).

The groups were moderated by a primary care physician, who had had a 2-day training on moderation of quality circles and who received supervision in about two sessions per year. One session per 1 or 2 months was planned (Wensing et al., 2009).

For this purpose (tutor system to support the moderators) 50 experienced facilitators were trained as quality circle tutors, who have been responsible for the training and further training of facilitators since 2001. In 2002 the KV Westfalen-Lippe followed this concept and trained 30 tutors. The encouraging experiences from both projects led to the KBV introducing the concept at a federal level in 2003. Since then it has trained 116 tutors [translated from German] (Siebolds et al., 2012).

In order to support the facilitators in the design of circle meetings, the KBV has developed structured didactic handouts for circle work, so-called quality circle manuals.... The materials are to be understood as recommendations.... [translated from German] (Siebolds et al., 2012).

The (facilitator) training usually lasts two days, i.e. between eight and 16 hours, usually twelve hours. ... In all twelve KVs, the trainers use the Quality Circle Handbook and their manuals. Further training for facilitators usually takes place in one day and lasts between three and ten hours [translated from German] (Siebolds et al., 2012).

- The organizational level (e.g., within a network that provides primary health care)

As a discussion platform, we developed special facilitator manuals according to a uniform didactic concept. It includes relevant clinical portraits (sleep disorders, back pain, upper abdominal pain, heart failure, etc.) in general practice. These materials provide the facilitators with guidance and make it possible to stimulate and supplement the problem-oriented discussion of the diagnostic and therapeutic procedure at critical points. ...In our opinion, the advantage of this approach is that it makes it easier to get started with concrete quality circle work and that quality circles can be implemented on a broad basis [translated from German] (Tausch et al., 1995)

External staff should organise QCs as facilitators have too little time to do this [translated from German] (Beyer et al., 1999)

The majority of respondents (85%) [HB: 87.1%] want or even urgently demand support for quality circle work from their Association of Statutory Health Insurance. In Saxony-Anhalt, the vast majority of respondents want both organisational support (e.g. by making rooms available, making contacts and making those contacts available - "start-up on site" - and granting reimbursement of expenses) and content-related support (e.g. by providing materials, topic recommendations, arranging speakers). In Bremen, primarily organisational support is expected [translated from German] (Beyer et al., 1999).

The participation of German GPs in QCs is mandatory in order to be part of government-funded disease management programs (DMPs) or to be part of pilot projects with health insurance funds (Vollmar et al., 2010).

Furthermore, some differences between the regions could be observed. In region 1 the impact seemed highest, which may be explained by the activities of the Association of Statutory Health Insurance ('Kassenarztliche Vereinigung') in that region regarding continuing professional education (Wensing et al., 2009).

Research evidence showed that budget constraints could reduce prescribing volume and costs (Wensing et al., 2009).

In the discussion with facilitators, the QC participants expressed their desire to be self-determined and work independently. For this reason, the Federal Association of Statutory Health Insurance Physicians (KBV) and the Associations of Statutory Health Insurance Physicians (KVen) have laid down the thematic and methodological autonomy of QCs as a prerequisite in their guidelines for quality circle work and have committed themselves to supporting them [translated from German (Siebolds et al., 2012).

- The national bureaucratic level (e.g., the Federal Office Public Health or similar administrative body)

Social Law Code has given new impetus to the obligation of the associations of statutory health insurance physicians to implement quality assurance measures. As early as 1991, the board of the Kassenärztliche Vereinigung decided to introduce nationwide quality circles as an instrument of quality assurance in outpatient care [translated from German] (Szecsenyi et al., 1994).

In January 1993, the Association of Statutory Health Insurance Physicians in Southern Baden constituted an interdisciplinary working group with the aim of developing the organisational and conceptual framework for the establishment of quality circles in the Southern Baden region [translated from German] (Tausch et al., 1995).

The participants expressed their fears that participation in the quality circle could lead to possible regulation by KV or health insurance companies [translated from German] (Andres et al., 1997).

The respondents are suspicious of an obligation for all physicians to participate in quality assurance measures. In Saxony-Anhalt in particular - as shown by the clear statements made by those surveyed - this scepticism is linked to the consideration that a commitment to quality assurance measures would be more acceptable if it also affected those colleagues who refrain from continuous medical education training [translated from German] (Beyer et al., 1999).

In 1993, the health structure law ('Gesundheitsstrukturgesetz') added more specific recommendations to the existing body of rules about quality assurance with the explicit aim to stimulate quality assurance programs in primary and hospital care (Aubke et al., 2003).

The principle of 'quality circles' is now also used for clearly defined quality promotion purposes: The Associations of Statutory Health Insurance Physicians (KVs) of Hesse, Saxony-Anhalt and Lower Saxony started off with structured QC programmes to demand rational pharmacotherapy. In the meantime, QCs have become a requirement in numerous contracts (for disease management, family doctor-centred care, etc.) [translated from German] (Andres et al., 2010).

In the discussion with facilitators, the QC participants' claim to be able to work in a self-determined and independent manner became apparent. For this reason, the National Association of Statutory Health Insurance Physicians (KBV) and the Associations of Statutory Health Insurance Physicians (KVs) have laid down the thematic and methodological autonomy of the circles as indispensable in their guidelines for quality circle work and have committed themselves to supporting them [translated from German] (Siebolds et al., 2012).

The majority of respondents in both regions expected to benefit from participation in QCs, but they were unwilling to accept the risk that QI could be misused for control or cost reduction [translated from German] (Beyer et al., 1999).

The respondents are suspicious of an obligation for all physicians to participate in quality assurance measures. In Saxony-Anhalt in particular - as shown by the clear statements made by those surveyed - this scepticism is linked to the consideration that a commitment to quality assurance measures would be more acceptable if it also affected those colleagues who refrain from continuous medical education training [translated from German] (Beyer et al., 1999).

Theories

The principle of *cooperative learning* refers to learning arrangements such as group work that requires coordinated, co-constructive activity by participants to develop a common solution to a problem or a shared understanding of a situation. The social context provides room for the desire for more fun in medical practice. In a good atmosphere, cooperative und mutual learning leads to the goal of increased flexibility in medical practice.

Kinship papers: CQI in Canada (osteoporosis)

Project Identifier: Canadian Quality Circle project

Topic: osteoporosis guideline adherence (Ioannidis et al., 2007, Ioannidis et al., 2008, Ioannidis et al., 2009)

Location: Canada

Dates Covered: 2007-2009

Overview

The CQC project was designed to improve adherence to osteoporosis guidelines. The intervention consisted of a national study across Canada. A multifaceted intervention was designed and a rather strict process applied starting with a training session and baseline data collection, followed by the educational intervention and the first follow-up data collection, a first strategy implementations session, a final educational intervention and data collection, and in the end, a final strategy implementation session. All in all, there were five meetings in each group.

Objectives

To increase guideline adherence for osteoporosis.

Context

5 meetings in groups of 8-15 GPs that lasted between 60 – 90 minutes following a strict procedure with the support of local opinion leaders, facilitated by trained GPs. The groups were formed by GPs in the same area. Participants received financial incentives.

Intervention activities

A trained facilitator guided the discussions and the process in the group. Didactic methods consisted of tailored feedback on own performance and evidence-based material in an atmosphere where interactive discussions took place. Local opinion leaders were additional resources. Facilitators led group discussions and tried to identify and eliminate barriers in the process. Patients received educational material.

Main quantitative Outcomes

84% of circle members agreed that the tailored feedback helped them understand their current practice patterns and helped them decide on areas that needed improvement. Objective measures corroborated increased adherence to Canadian guidelines for Osteoporosis.

Main qualitative outcomes

The intervention was well received among GPs.

Main Themes and Propositional Statements

Outcome 1: addressing practitioners' needs

Mechanisms: sharing similar needs / size of group affects communication.

The workshop was based on a provincial learning needs assessment and data from focus groups of family physicians from each of the provinces to ensure the curriculum material would meet the needs of physicians across Canada (Ioannidis et al., 2007).

Outcome 2: forming and Norming the Group

Mechanisms: need for relatedness / need for autonomy

A maximum of 15 physicians in each geographical area were enrolled into each circle in the study (Ioannidis et al., 2008).

Outcome 3: exchanging experiences and failures

Mechanisms: need for competence and self-actualisation

An osteoporosis specialist was assigned to each quality circle (Ioannidis et al., 2008).

Outcome 4: identifying learning needs, planning actions, setting priorities and goals

Mechanisms: previous knowledge is activated / cognitive dissonance

Following the training meeting, CQC members collected baseline data on patients from their practices using the CQC-form to ascertain how they currently diagnosed and treated osteoporosis…. These profiles, displayed graphically with brief text summaries, permitted anonymous comparisons of individual circle members' practices (Ioannidis et al., 2007).

It involved practice audits, feedback on performance by peers …, interactive discussion of evidence, small-group educational workshops led by … facilitators and supported by local osteoporosis specialists, diagnosis and treatment reminders (CQC-forms), and making personal plans for improving clinical management of osteoporosis in accordance with the OC 2002 guidelines (Ioannidis et al., 2007).

Physician profiles were displayed graphically with a brief text summary. The profiles permitted anonymous comparisons of individual circle member data with their peers in their circle and with all the participating physicians in the project (Ioannidis et al., 2008).

Based on the questionnaire responses, physician profiles were generated that showed how individual physicians treated patients …. The profiles permitted anonymous comparisons of individual circle member data with their peers … and with all the participating physicians …. The physicians' profiles were than compared to the Osteoporosis Canada guidelines (Ioannidis et al., 2009).

The evaluation of physician profiles, an educational workshop, and facilitators led small group discussions that identify barriers to the management of osteoporosis and strategies to improve patient care, family physicians demonstrated greater odds of administering osteoporosis therapy appropriately over a two year period (Ioannidis et al., 2009).

Outcome 5:creating the learning environment

Mechanisms: social learning

The educational intervention consisted of eight key components: 1) audit and feedback, …; 2) interactive small group discussions …; 3) use of opinion leaders …; 4) reminders, …; 5) multi-professional collaboration and community building … (Ioannidis et al., 2008).

Our educational intervention consisted of eight key components and consisted of 1) audit and feedback, 2) interactive small group discussions 3) use of opinion leaders, 4) remainders, 5) multiprofessional collaboration with osteoporosis specialists, 6) nominal financial reimbursement to circle members, 7) patient medicated interventions 8) and educational material (Ioannidis et al., 2009).

Outcome 6: seeking solutions and adaptions, creating new knowledge

Mechanisms: interdependence between insurers and QCs / interdependence among group

members

Discussions concerning the progress made by incorporating strategies identified in the prior phases of the project were shared among the group. Based on the major findings from the profiles, members discussed additional measures that should be implemented in their practices to increase alignment with the 2002 guidelines (Ioannidis et al., 2008).

Outcome 7: systematic Use of new knowledge

Mechanisms: repetition priming and automaticity

Contextual levels

- The level of the individual (capabilities and motivations)
- The group level (the group and the facilitation process)

The CQC facilitators were local family physicians recruited and trained specifically to lead study meetings. They were chosen by the CQC steering committee for their skills in facilitating small-group activities, their known interest in chronic disease management, and their involvement in continuing professional development (Ioannidis et al., 2007b).

Before the meetings, train-the-trainer workshops were conducted to assist facilitators in their role as group leaders (Ioannidis et al., 2007b).

Facilitators were local family physicians recruited to lead and initiate discussion at study meetings and were chosen because of their skills in small group facilitation and

involvement in continuing professional development and were selected by the study's steering committee (Ioannidis et al., 2008).

- The organizational level (e.g., within a network that provides primary health care)
- The national bureaucratic level (e.g., the Federal Office Public Health or similar administrative body)

Theories

The principle of QCs originates from the assumption that those involved in a job are best qualified to identify deficiencies and suggest improvements. The Quality Circle technique is an effective stepwise knowledge translation approach that increases primary care physicians' awareness and assessment of diseases in accordance with evidence-based material.

Kinship papers: pharmacist led QC in Switzerland

Project Identifier: pharmacist led QC in Switzerland

Topic: improvement of prescription habits and reduction of drug costs (Bugnon et al., 2004, Niquille et al., 2010)

Location: Switzerland

Dates Covered: 2004-2010

Overview

GPs in Freiburg introduced doctor-pharmacist quality circles in 1997-98 by with the aim to improve the quality of drug prescribing. On a voluntary basis, five to fifteen family physicians meet 4 to 6 times a year together with 1 to 3 pharmacists who act as facilitators. The groups preferably work in a local or regional network. The facilitators compare statistical data on drug prescriptions, provide relevant pharmacological information, answer questions from practitioners and build consensus on good practice. Three of these kinship papers were excluded because of double reporting and no further information concerning the process.

Objectives

To improve quality of drug prescriptions and to reduce drug costs.

Context

Local GPs meet at regular intervals with local pharmacists to improve their drug prescriptions. Pharmacists take on the role of specialists and facilitators.

Intervention activities

Analysis of prescription data illustrating individual profiles pharmacists have access to. Costs, the frequency of prescription, the percentage of generics and details of the prescribed drugs are analysed and compared with one another. Pharmacists provide a summary of published literature with emphasis on scientific evidence. Best options on the market are offered as to pricing. A prescription consensus is presented on the basis of the available data.

Main quantitative Outcomes

Reduction of drug costs.

Main qualitative outcomes

Prescription patterns improved.

Main Themes and Propositional Statements

Outcome 1: addressing practitioners' needs

Mechanisms: sharing similar needs / size of group affects communication

One of the strengths of the programme is its adaptation to the needs of GPs and pharmacists [translated from French] (Bugnon et al., 2004).

GPs' participation in PPQC meetings is accredited by the association for their continuing education (Niquille et al., 2010).

Outcome 2: forming and Norming the Group

Mechanisms: need for relatedness / need for autonomy

Thus, it is a stable and voluntary group of five to eight doctors who meet about five times a year with a pharmacist, expert and facilitator, in a context of interdisciplinary continuing education [translated from French] (Bugnon et al., 2004).

A quality circle is a stable group of 3–10 GPs with … 1 trained pharmacist. Pharmacists volunteer as facilitators and are responsible for motivating local GPs to participate. They … organize the practical … (e.g., rooms, agenda) and get the prescribing profiles of the participating GPs) (Niquille et al., 2010).

The PPQC process includes a combination of several elements (e.g., local networking, feedback, interdisciplinary continuing education) that facilitate changes in prescribing practice GPs (Niquille et al., 2010).

Outcome 3: exchanging experiences and failures

Mechanisms: need for competence and self-actualisation

Discussions in the QCs are often lively and then lead to the determination of a consensus that everyone is committed to implementing in the best possible way [translated from French] (Bugnon et al., 2004).

Outcome 4: identifying learning needs, planning actions, setting priorities and goals

Mechanisms: previous knowledge is activated / cognitive dissonance

The pharmacist compares individual prescribing habits with treatment recommendations (clinical guidelines) and with the most up-to-date information on the efficacy of the medication [translated from French] (Bugnon et al., 2004).

Outcome 5:creating the learning environment

Mechanisms: social learning

The key elements are local networking; feedback of comparative and detailed data regarding costs, drug choice, and volume of medical prescriptions; as well as interdisciplinary continuing education adapted to primary care needs (Niquille et al., 2010).

Outcome 6: seeking solutions and adaptions, creating new knowledge

Mechanisms: interdependence between insurers and QCs / interdependence among group

members

Back at the practice, the difficulty is to apply the consensus reached in the group, while considering the particular situation of each patient (Bugnon et al., 2004).

An analysis of prescription attitudes in comparison with scientific and economic data and the search for alternatives in the drug market is then run by each PPQC to build its own consensus. An annual assessment is conducted for facilitating the continuing improvement of the process (Niquille et al., 2010).

The discussions within PPQCs are often lively and end in the determination of a common consensus that everyone makes a commitment to apply to the best of his or her ability (Niquille et al., 2010).

Outcome 7: systematic Use of new knowledge

Mechanisms: repetition priming and automaticity

The analysis that is carried out each year secures change, as they give the pharmacist the means to maintain motivation: each doctor receives detailed feedback on their successes and the progress still to be made in relation to a control group (doctors working without particular collaboration with pharmacists) and in relation to the good results of other colleagues [translated from French] (Bugnon et al., 2004).

The evaluations of the GPs' prescriptions are performed every year to provide concrete feedback and a source of motivation … to change prescription attitudes (Niquille et al., 2010).

The constant feedback on progress achieved and the further possible improvements are other success factors (Niquille et al., 2010).

Contextual features

- The context of the group and their facilitation

Thus, it is a stable and voluntary group of five to eight doctors who meet about five times a year with a pharmacist, expert and facilitator, in a context of interdisciplinary continuing education [translated from French] (Bugnon et al., 2004).

- The organisational context where the group works in, for instance a network providing primary health care

Very simple, inexpensive organisational structure based on the existing local networks makes the process easier [translated from French] (Bugnon et al., 2004).

Pharmacists' organisation provides evidence-based summaries and formats individual data [translated from French] (Bugnon et al., 2004).

- The organisational context of the federal office Public Health (or similar national administrative level)

Theories

None mentioned.

European Drug Education Project

Project Identifier: Drug Education Project

Topic: improvement of prescription patterns (Lundborg et al., 1999a, Lundborg et al., 1999b, Veninga et al., 1999, Lagerlov et al., 2000, Veninga et al., 2000)

Location: Sweden, Norway, The Netherlands

Dates Covered: 1999 -2000

Overview

Inappropriate prescribing patterns concerning patients with urinary tract infections (UTI) or asthma are common problems within primary health care. This approach used a workshop on the topic followed by discussions and reflective thinking of prescription patterns in groups to change behaviour. This model of CME emphasizes the importance of the use of existing knowledge in professional learning.

Objectives

The intention of the study was to test whether an educational model based on outreach visits and academic detailing improved prescription habits concerning drug choice for patients with urinary tract infections or asthma.

Context

The study took place in the Swedish, Norwegian and Dutch PHC setting. Pre-existing CME groups were randomly assigned to education on UTI or asthma as part of the European Drug Education Project (DEP) and served as each other's controls

Intervention activities

A GP or a pharmacist led two peer group discussions. During a first meeting, participants received information about their judgements of written simulated cases. They discussed actual

decisions taken on the simulated cases, the extent of use of evidence-based information and tried to reach a consensus. GPs could also discuss records of difficult clinical cases they had in their own practice. During the second meeting, the group talked about prescribing data of the pre intervention phase, discussed actual decisions and took into account difficult clinical cases they had in their own practice.

Main quantitative outcomes

Prescribing of first choice UTI drugs increased in the intervention arms ($P < 0.001$). The proportion of patients receiving an inhaled corticosteroid increased insignificantly in both study arms. There was an increase of acceptably treated patients in the asthma ($p < 0.05$) relative to the control group among Norwegian groups.

Main qualitative outcomes

In the Swedish trial, 87% of participating GPs wanted to take part in similar CME activities for other conditions. 84% of the participants agreed that the educational activity was important and about 80% agreed that it was useful for their daily work. Among Norwegian GPs, eighty (93%) in the asthma groups and 77 (96%) in the UTI groups judged the educational intervention to be suitable also for changing treatment of other diseases.

Main Themes and Propositional Statements

Outcome 1: addressing practitioners' needs

Mechanisms: sharing similar needs / size of group affects communication

When asked, GPs also express a need for drug information/education that is academic and not promotional (Lundborg et al., 1999b).

The participants were not offered any extra incentives, except for the education itself (Lundborg et al., 1999b).

When looking at knowledge and attitudes, the largest improvements were indeed seen when the baseline performance was low (Veninga et al., 1999).

Outcome 2: forming and Norming the Group

Mechanisms: need for relatedness / need for autonomy

It is important for a learner to be in control of his or her learning process, to be motivated, and to perceive meaningfulness (Lundborg et al., 1999a).

GPs had to join as groups; c) groups had to be pre-existing; d) the preferred group size was three to six (Lundborg et al., 1999a).

A higher appreciation of the quality of the group discussion led to more effect of the intervention on the treatment of asthma exacerbations and on the duration of treatment prescribed for uncomplicated urinary tract infections (Veninga et al., 2000).

The quality of the group discussion as evaluated by the participants seems to be an important predictor of successful educational group meetings (Veninga et al., 2000).

The effect of the educational asthma programme was partly modified by the group size; prescribing behaviour for (asthma) exacerbations improved more in smaller groups. The group size varied from 4 to 13 ……. This result is ……. an optimal group size of 5 to 6 group members (Veninga et al., 2000).

Outcome 3: exchanging experiences and failures

Mechanisms: need for competence and self-actualisation

(GPs)... depend less on factual knowledge than on their capacity to reflect in action, to be in control of ... learning process, to be motivated, and to perceive meaningfulness; ... it is beneficial ... when the social climate is supportive … (Lundborg et al., 1999a).

The GPs were asked to bring copies of the records for these patients to the meeting. During the meetings, the treatment of these specific patients was discussed, especially differences between what was prescribed according to the records and what was actually dispensed (Lundborg et al., 1999a).

When studying how physicians learn and change their medical practice, disposing, enabling, and forcing factors can be identified. These are a mix of professional factors, such as the desire for competence, social factors such as working climate, and personal factors such as curiosity (Lundborg et al., 1999a).

Theories of adult learning stress the importance of motivation; the doctors must see the need and be willing to change their behavior to increase their professional competence (Veninga et al., 1999).

Problem based learning, …, places the emphasis on the learner's own initiative to discover problems and how to improve. By discussion in peer review groups the individual doctor's self-efficacy, defined as one's ability to organise and execute a course of action required to produce given results, is substantially increased (Lagerlov et al., 2000).

At the first meeting the GPs discussed in groups how they diagnose the illness, and the underlying reasons they find important when deciding on treatment (Lagerlov et al., 2000).

The first step is becoming aware that a problem may exist in one's practice behavior (Veninga et al., 2000).

Outcome 4: identifying learning needs, planning actions, setting priorities and goals

Mechanisms: previous knowledge is activated / cognitive dissonance

... their perception of a gap between their current knowledge and skills and those needed. ... Cognitive feedback is feedback on the decision process, i.e., why or how a decision is made and not on the decision itself, i.e., which decision is taken (outcome) (Lundborg et al., 1999a).

The intervention comprised several elements, ... the provision of individual feedback on the series of simulated cases ... and on actual prescribing, use of outreach visits, use of peer group discussions, and use of existing guidelines. ..., the sessions were especially tailored for each group (Lundborg et al., 1999a).

... feedback regarding the written simulated case ... feedback on actual decisions taken ..., the extent of use of the information factors ... and the agreement on decisions between individual members within the group (Lundborg et al., 1999a).

The combination of the written simulated cases with actual prescribing allows the GPs to reflect on their decisions as well as the background for these decisions, and is in line with suggestions to make drug utilization studies closer to the reality of practice (Lundborg et al., 1999a).

Feedback was given on actual decisions… and factors taken into account when these decisions were made—so-called cognitive feedback—in our case, clinical judgment analysis (CJA))(Lundborg et al., 1999b)

Outcome 5:creating the learning environment

Mechanisms: social learning

For UTI the usually high use of the non-recommended drugs was stressed and was related to the ... high use in the simulated cases and the cues that triggered these decisions… the identity of the individual doctor was disclosed at the request of the participating GPs (Lundborg et al., 1999a).

Learning methods that have proven effective include interactive and problem-solving exercises combined with feedback on performance. Combined strategies that deal with different types of barriers seem to be more effective than single separate strategies (Veninga et al., 1999).

Once the problem is acknowledged, one must learn and understand what caused the problem and how it can be solved. For this, elucidating and discussing the decision process underlying treatment decisions may be useful. To accept new information or practice recommendations the credibility of the source is of importance (Veninga et al., 2000).

… overview of the recommendations given in the guidelines. The major component … was to discuss individualized feedback on the decision process underlying treatment decisions, …. Using series of 18 case vignettes, factors triggering specific treatment decisions were identified …. The case vignettes were constructed to represent real patients … (Veninga et al., 2000).

The educational program combined feedback on decision strategies with feedback on decision outcomes (actual prescribing behavior) offering introspection of what was prescribed and which factors triggered optimal and suboptimal prescribing. Another important characteristic of the program was that all feedback was presented and discussed within the group (Veninga et al., 2000).

Outcome 6: seeking solutions and adaptions, creating new knowledge

Mechanisms: interdependence between insurers and QCs / interdependence among group members

These results make clear that, although in the educational program a lot of attention was paid to overcome barriers within GPs, barriers within practice setting may not have been sufficiently addressed, preventing the correct implementation of the recommendations concerning asthma maintenance treatment in practice (Veninga et al., 2000).

International and national guidelines are more difficult to implement than local or internally developed guidelines (Veninga et al., 1999).

Barriers within doctors relate to competence, motivation and attitudes, and personal characteristics such as learning style, whereas barriers within practices exist as doctors do not work entirely independently (Veninga et al., 1999).

Only in The Netherlands, national guidelines were developed by GPs and intended primarily for their use. This guideline initiative has been quite successful and highly accepted, because it is initiated and "owned" by the GPs themselves (Veninga et al., 1999).

.. study feedback to individual doctors ... ... The recommendations needed to be reformulated to enable a quality assessment of patient treatment to be judged from prescription feedback. Such quality criteria were developed during group discussions between doctors participating in the study (Lagerlov et al., 2000)

Doctors may, during this active process, discover the consequences of new knowledge in relation to their own behaviour (Lagerlov et al., 2000).

Once a doctor has accepted a new practice and has the intention to change, there still may be several barriers within the practice setting that prevent the actual implementation in practice [7]. Discussing problems encountered in everyday practice may help to overcome such barriers to implementation (Veninga et al., 2000).

Outcome 7: systematic Use of new knowledge

Mechanisms: repetition priming and automaticity

Doctors who were accustomed to discussing their prescribing in peer groups changed their behavior more as a result of such (iterating) peer group meetings than doctors who are not used to this approach (Veninga et al., 1999).

Self-rating has previously been shown to relate to an actual change in behaviour (Lagerlov et al., 2000).

The higher the attendance rate and the more experienced the GPs in a group were, the shorter the courses were prescribed for UTI after the intervention (Veninga et al., 2000).

Contextual levels

- The level of the individual (capabilities and motivations)
- The group level (the group and the facilitation process)

The facilitators presented the feedback in a stepwise manner and restricted their own talking time to encourage discussion among the GPs and to give them the opportunity to be the main actors (Lundborg et al., 1999a, Lagerlov et al., 2000).

The groups themselves assigned one or two members as moderator(s) (Veninga et al., 2000).

- The organizational level (e.g., within a network that provides primary health care)
- The national bureaucratic level (e.g., the Federal Office Public Health or similar administrative body)

Theories

Adult learning Theory

Among components of CME that have been shown to change behavior (9) are: a) use of multifaceted interventions; b) use of outreach visits; c) involving representatives of the target group in the development process; d) use of guidelines; e) defining clinical needs; f) use of audit and feedback; g) addressing specific barriers to change; and h) peer group discussions.

Social Judgement Theory

Several steps:

Awareness that a problem may exist in one's practice

Understanding what causes the problem

Credibility of the source of information about new ways of managing the problem

Open acknowledgement and discussion about individuals' doubts about the new ways of managing the problem

Recognition that social force may accelerate acceptance of a new change in practice

Identification of barriers to implementation of the new change in practice

Identification and implementing ways of overcoming these barriers

European Single studies: Swedish peer review groups

Project Identifier: Swedish peer review groups

Topic: Swedish peer review groups (Eliasson and Mattsson, 1999)

Location: Sweden

Dates Covered: 1999

Overview

Although widely used in Sweden, small CME groups are less common than traditional CME activities, such as lectures. Group work may enhance knowledge development, enable the assessment of individual learning needs and facilitate the adoption of national guidelines and agreements between primary and secondary care. A competent group leader or facilitator seems crucial (Eliasson and Mattsson, 1999).

Objectives

The intention of the paper was to give an overview of CME group work in Sweden and describe their strengths and weaknesses.

Context

In 1998, nearly half of the Swedish GPs participated in CME groups. On a voluntary basis, they met once or twice a month in groups of 5 – 10 GPs to reflect on and improve their standard practice using pre-arranged learning modules

Intervention activities

Prearranged modules contain short introductions and facts about a subject aimed at facilitating

group discussions. Small groups discuss the ‘‘art of medicine’’, based on patient stories of illness and personal experiences. Reflection on emotional responses is part of the group process.

Main quantitative outcome

Eighty per cent of group members judged the educational value of the group sessions to be greater or equal in comparison with self-studies or activities sponsored by the drug industry.

Main Themes and Propositional Statements

Outcome 1: addressing practitioners’ needs

Mechanisms: sharing similar needs / size of group affects communication

Doctors learn best when they recognise the need for learning and when learning is self-directed

Many studies have shown that small group sessions are one of the most popular and stimulating CME activities practised by doctors.

The idea of problem-based and self-directed learning from everyday practice, closely linked to quality improvement, seemed to appeal to many Swedish GPs and the CME programme was successively accepted by the majority of them.

Outcome 2: forming and Norming the Group

Mechanisms: need for relatedness / need for autonomy

…GPs regard the group as a place for social support, ..., growth in the professional role …for protection against burnout. Although … main purpose of small group work is exchange …… of knowledge, social aspects should not be neglected because they will increase the motivation to continue with meetings.

In time, group members develop confidence and security in the group, rendering the disclosure of ignorance and ‘‘blind spots of knowledge’’ easier. Group members could either use the whole group or parts of it to assess their own learning needs.

The weaknesses of small CME groups relate predominantly to their vulnerability. A dysfunctional group is constantly threatened by disintegration.

The group should act as a forum where its members can reflect freely upon all problems that bind them together in their profession.

Outcome 3: exchanging experiences and failures

Mechanisms: need for competence and self-actualisation

The desire to be more competent and ‘‘pride in performance’’ are other key forces for change, while regulatory measures have little impact

Case discussions were by far the most popular agendas in groups

Subjects, themes and cases discussed in groups come from daily work and are highly relevant to practice. The small group will meet the demands of developing the generalist knowledge as well as the expert role in general practice

Group work is built on sharing and improving ‘‘collective’’ knowledge and well-functioning groups provide this in an atmosphere of joy and curiosity.

Small groups will have opportunities to discuss the ‘‘art of medicine’’, founded upon context, anecdote, patient stories of illness and personal experiences (21). Accepting emotional responses being mirrored by other group members corresponds in some respects to the process in Balint groups.

In addition, small group members have unique opportunities to discuss the way the individual patient experiences his or her illness through narratives, retold by the doctor.

Outcome 4: identifying learning needs, planning actions, setting priorities and goals

Mechanisms: previous knowledge is activated / cognitive dissonance

Although academic knowledge is important, the fundament for professional development is reflection of one’s own practice or, as Schön stated, ‘‘reflection-in-action’’. Until now, these aspects of learning have been mostly neglected, and teacher-led lectures along with journal reading continue to be the most common form of CME activities.

Outcome 5: creating the learning environment

Mechanisms: social learning

The strengths of small CME groups are principally that learning is self-directed and based on relevant problems and ‘‘reflection-on-action’’, a pedagogic prerequisite for effective learning.

Outcome 6: seeking solutions and adaptions, creating new knowledge

Mechanisms: interdependence between insurers and QCs / interdependence among group members

Outcome 7: systematic Use of new knowledge

Mechanisms: repetition priming and automaticity

Contextual levels

- The level of the individual (capabilities and motivations)
- The group level (the group and the facilitation process)
- The organizational level (e.g., within a network that provides primary health care)

In addition, long-term maintenance of small groups implies a national support for CME in general practice with enough personnel and economic resources to assist all those GPs who have key roles in providing CME at the local level.

- The national bureaucratic level (e.g., the Federal Office Public Health or similar administrative body)

- **Theories**

European Single studies: French quality circle

Topic: improving prescription patterns in French primary health care (Riou et al., 2007)

Location: France

Dates Covered: 2007

Overview

Increasing costs for drugs are a problem in France. It is difficult to tackle because France has a fee-for -service system that allows the patient to consult any physician to get hold of drugs. A controlled before and after study was conducted to test a multifaceted intervention in French QCs to improve prescription patterns. Expert input during plenary sessions took place four times a year. GPs participated in QCs every sixth week where they received voluntary feedback, peer review, and specific recommendations for changes. Evidence-based prescription increased and costs decreased.

Objectives

To improve prescription patterns and to decrease prescription costs.

Context

Primary health care in three areas in French Brittany.

Intervention activities

4 plenary meetings with consultants lecturing on prespecified topics; QCs every 6th week using personalised feedback, discussions, peer review and recommendations on change.

Main quantitative Outcomes

The programme increased generic prescription rates, and decreased the non-evidence-based prescription of drugs. The potential annual cost reduction (€144 250) slightly exceeded the cost of the programme (€136 000).

Main qualitative outcomes

Main Themes and Propositional Statements

Outcome 1: addressing practitioners' needs

Mechanisms: sharing similar needs / size of group affects communication

A meeting attendance fee was paid to the GPs, €70/hour for a plenary meeting (with the consultants), €45/hour for a quality circle meeting.

Outcome 2: forming and Norming the Group

Mechanisms: need for relatedness / need for autonomy

Outcome 3: exchanging experiences and failures

Mechanisms: need for competence and self-actualisation

Outcome 4: identifying learning needs, planning actions, setting priorities and goals

Mechanisms: previous knowledge is activated / cognitive dissonance

… to introduce independent information about polymedications, …. During these meetings, public health consultants also provided feedback information about prescribing patterns and cost. Quality circles (two in each area) met every 6 weeks and some GPs were trained and given documentation

The current programme was multifaceted and included expert input, voluntary feedback, peer review, and specific recommendations for changes: all features generally associated with the successful implementation of changes in general practice.

Outcome 5: creating the learning environment

Mechanisms: social learning

Outcome 6: seeking solutions and adaptions, creating new knowledge

Mechanisms: interdependence between insurers and QCs / interdependence among group members

Outcome 7: systematic Use of new knowledge

Mechanisms: repetition priming and automaticity

Contextual levels

- The level of the individual (capabilities and motivations)
- The group level (the group and the facilitation process)
- The organizational level (e.g., within a network that provides primary health care)
- The national bureaucratic level (e.g., the Federal Office Public Health or similar administrative body)

Theories

European Single studies: Austrian quality circle on drug prescription

Project Identifier: Austrian quality circles

Topic: drug prescription (Spiegel et al., 2012)

Location: Austria

Dates Covered: 2012

Overview

In Austria, drug costs rise rapidly at the same time as prescription of generics is low. District Health Insurance Funds initiated QCs for pharmacotherapy (QCPs) to foster critical drug prescription and the use of generics. The steering group of the Vienne District Health Insurance Fund prepared educational material on specific topics of pharmacotherapy and provided repeated written feedback to participants on their prescribing behaviour. 8-10 GPs met twice a year to discuss different topics and their results. An evaluation of the minute taken during the meetings provided insight into the exchange among professionals that took place. They showed that GPs became actively involved in a process of behaviour change. Prescription patterns improved and prescription of generics increased.

Objectives

To improve prescription habits and increase the prescription of generics.

Context

The Vienna District Health Insurance Fund organised QCs on pharmacotherapy, provided educational material and written individualised feedback on prescription patterns. Participants received a small financial incentive.

Intervention activities

Specially trained GPs facilitated the groups of 8-10 GPs who met twice a year. They provided the group with evidence-based information and statistics on specific topics of pharmacotherapy and led the discussions in the group. Individualised written feedback on prescription was part of the discussion.

Main quantitative Outcomes

Prescription patterns improved and prescription of generics increased.

Main qualitative outcomes

GPs appreciated this type o QC despite initial concerns because of its origin (District Health Insurance Fund). They acknowledged the advantages of generic drugs and changed their attitude towards their prescription. They practised communication with patients in the situation of changing original to generic drugs and the feeling of competence increased.

Main Themes and Propositional Statements

Outcome 1: addressing practitioners' needs

Mechanisms: sharing similar needs / size of group affects communication

The QCPs were designed as a measure of quality assurance in pharmacotherapy and, as doctors were expected to encounter various problems in educating their patients in the use of generics, to offer them a forum for discussing these with their peers.

Outcome 2: forming and Norming the Group

Mechanisms: need for relatedness / need for autonomy

Although the optimum number of participants for quality circles is between eight and 10 [15], when necessary, up to 16 per circle were allowed.

Outcome 3: exchanging experiences and failures

Mechanisms: need for competence and self-actualisation

GPs participated somewhat reluctantly 'in order to avoid trouble', but over time most of them began to look forward to regular attendance and enjoyed … opportunity for an exchange … in a relaxed setting.

Outcome 4: identifying learning needs, planning actions, setting priorities and goals

Mechanisms: previous knowledge is activated / cognitive dissonance

As GPs had previously found its provision of diagnostic and therapeutic guidelines feasible and effective, the steering group .. prepared educational material …. In addition to prescribing behaviour, costs of drugs prescribed and the use of generics in primary care, … were addressed.

They supplied statistics on all drugs prescribed by GPs under contract and the costs involved, so that the intervention provided a repeated written feedback to participants on their personal prescribing behaviour.

Outcome 5: creating the learning environment

Mechanisms: social learning

…, hardly any participants failed to contribute to the group discussions. … they thought that for a meaningful comparison of prescription costs such data must be correlated with morbidity and disorder distribution among patients. Every opportunity was taken to discuss various clinical aspects of patient management and pharmacotherapy.

…, CME should involve the learner actively and as we know from the protocols that there were hardly any participants who did not contribute to the discussions, we can say that our qualitative data support the general notion that quality circles are an appropriate CME format for practising physicians.

Outcome 6: seeking solutions and adaptions, creating new knowledge

Mechanisms: interdependence between insurers and QCs / interdependence among group members

.. over time those GPs who, at first, were reluctant to prescribe generics changed their attitude, …. After 2 years of QCP participation ..., GPs confirmed that the prescribing of generics, where appropriate, had for them become common practice and that their efforts and the various discussions… had helped.

Outcome 7: systematic Use of new knowledge

Mechanisms: repetition priming and automaticity

Protocol

The protocols contained not only the opinions and related experiences of GPs and QCP leaders, but also reported reactions and opinions of patients. In some protocols, discussions were written down in full detail; in others only key issues. QCP leaders also documented opinions with a varying degree of detail.

Contextual levels

- The level of the individual (capabilities and motivations)
- The group level (the group and the facilitation process)

The QCP leaders, all experienced GPs and GP trainers, attended special meetings held twice a year. Their duties were to fix dates for quality circles, conduct these and give introductory talks on intended topics.

Participants preferred (and we assume that this is the preference of QC Participants everywhere) QCP leaders to give the introductory talk seated, rather than standing in an authoritative position.

- The organizational level (e.g., within a network that provides primary health care)
- The national bureaucratic level (e.g., the Federal Office Public Health or similar administrative body)

Theories

European Single studies: Austrian topic specific quality circle

Project Identifier: Austrian topic specific quality circle

Topic: drug replacement therapy using synthetic opioids (Tonies et al., 2006)

Location: Austria

Dates Covered: 2000 - 2001

Overview

In 1998, the Austrian Narcotic Drugs Act introduced a new version which allows social authorities to order health-related measures instead to report to the police. These include psychotherapeutic and psychosocial interventions and the substitution of drugs by substances which are less harmful than the drugs consumed: substitution therapy. GPs who take care of these patients meet at regular intervals to improve knowledge about drug addiction and increase frustration tolerance. The QCs led by GP facilitators and local opinion leaders all well received among Austrian GPs.

Objectives

Improved care of patients with drug replacement therapy using synthetic opioids in primary health care: better social integration of drug users and reduction of drug-related crime.

Context

Austrian GPs have to take part in these QCs if they want to get reimbursement of this kind of treatment (drug replacement therapy using synthetic opioids)

Intervention activities

Experts (local opinion leaders) introduced topics; facilitators (GPs) lead discussion with the aim to increase knowledge but also to increases self-awareness and frustration tolerance.

Main quantitative Outcomes

None

Main qualitative outcomes

90 % of the GPs were highly or well satisfied with the teaching. 2. They felt that communication skills improved and GPs' tolerance of “difficult” patients improved. 3. Topic specific knowledge increased

Main Themes and Propositional Statements

Outcome 1: addressing practitioners’ needs

Mechanisms: sharing similar needs / size of group affects communication

Quality circles for drug therapy are highly valued by the participants [translated from German].

Outcome 2: forming and Norming the Group

Mechanisms: need for relatedness / need for autonomy

Outcome 3: exchanging experiences and failures

Mechanisms: need for competence and self-actualisation

Information and group discussion with corresponding self-reflection improved the way colleagues deal with the "difficult" clientele like drug addicts. Increase of factual knowledge in various important areas of drug therapy [translated from German].

The numerous topics (Table 1) are offered as lectures. The session is conducted in the manner of a modified Balint group. In contrast to the classical Balint group, topics are presented instead of medical histories. Similar to the classical Balint group, each participant can also bring in his or her personal experiences and insights into the discussion, which may possibly relieve some of the emotional strain [translated from German].

There is increased self-awareness and also support from the group in the required handling of drug patients, who are among the "difficult patients" and require a special degree of tolerance on the part of the practitioner [translated from German].

Outcome 4: identifying learning needs, planning actions, setting priorities and goals

Mechanisms: previous knowledge is activated / cognitive dissonance

Outcome 5: creating the learning environment

Mechanisms: social learning

Outcome 6: seeking solutions and adaptions, creating new knowledge

Mechanisms: interdependence between insurers and QCs / interdependence among group members

Outcome 7: systematic Use of new knowledge

Mechanisms: repetition priming and automaticity

Contextual levels

- The level of the individual (capabilities and motivations)
- The group level (the group and the facilitation process)
- The organizational level (e.g., within a network that provides primary health care)
- The national bureaucratic level (e.g., the Federal Office Public Health or similar administrative body)

Theories

European Single studies: Belgian quality circles

Project Identifier: Belgian quality circles

Topic: improvement of antibiotic prescribing of patients with acute rhinosusitits (van Driel et al., 2007)

Location: Belgium

Dates Covered: 2007

Overview

High prescription and inappropriate choice of antibiotics in patients with rhinosinusitis is common in Belgium. QCs are common and GPs in these groups continuously assess the quality of performance. They are supposed to work on the basis of GPs mutual respect and commitment to QI. All GPs received a treatment guideline on the top by mail. GPs in the nine QCs allocated to the intervention arm received an additional group intervention in form of evidence-based material for one session that was handed to the facilitator. The intervention did not have any effect

Objectives

To evaluate the effect on antibiotic prescribing of an intervention in existing local QCs promoting an evidence-based guideline for acute rhinosinusitis

Context

Facilitators of 9 QCs received evidence-based information material, including recommendations, underpinning flow charts, research evidence on patient expectations concerning antibiotics, patient information, leaflets and clinical case vignettes for discussions in small groups

Intervention activities

They are not described, only implied by the material mentioned above.

Main quantitative Outcomes

No change in prescription of antibiotics

Main qualitative outcomes

Main Themes and Propositional Statements

Outcome 1: addressing practitioners' needs

Mechanisms: sharing similar needs / size of group affects communication

Outcome 2: forming and Norming the Group

Mechanisms: need for relatedness / need for autonomy

Mutual respect, commitment and continuity are thought to provide the strong base required for change.

Outcome 3: exchanging experiences and failures

Mechanisms: need for competence and self-actualisation

A defensive attitude of the GP, for instance, been linked to overprescribing, Quality improvement requires a reflective attitude of one's own knowledge and performance.

Outcome 4: identifying learning needs, planning actions, setting priorities and goals

Mechanisms: previous knowledge is activated / cognitive dissonance

There is, however, adequate evidence that merely distributing a guideline without any additional intervention does not have an effect on prescribing behaviour.

Outcome 5: creating the learning environment

Mechanisms: social learning

Outcome 6: seeking solutions and adaptions, creating new knowledge

Mechanisms: interdependence between insurers and QCs / interdependence among group members

Outcome 7: systematic Use of new knowledge

Mechanisms: repetition priming and automaticity

Given the fact that this large effect was found in studies with more intensive interventions, such as individual academic detailing visits or multiple contacts, it is probable that the true effect of unsupported group interventions is lower than desired.

In contrast to our pragmatic study, the interventions in most trials consist of multiple sessions on the same topic supervised by a researcher or an expert, a situation usually very different from real life.

Contextual levels

- The level of the individual (capabilities and motivations)
- The group level (the group and the facilitation process)

During this visit, the material for the group meeting was presented—that is, a presentation of the main recommendations and the scientific evidence underpinning them, flowcharts, research evidence on patient expectations concerning antibiotics, patient information leaflets and clinical case vignettes for discussions in small groups.

- The organizational level (e.g., within a network that provides primary health care)
- The national bureaucratic level (e.g., the Federal Office Public Health or similar administrative body)

Theories

European Single studies: English peer review groups

Project Identifier: English peer review groups

Topic: reflective groups (Watkins et al., 2004)

Location: England

Dates Covered: 2004

Overview

Inappropriate and expensive prescription patterns are a problem for English Primary Care Trusts. Costly GP prescriptions may be due to company representatives who promote new and expensive drugs, non-evidence-based prescriptions of drugs or the habit of ending the consultation with a prescription. Providing protected time for educational sessions is a prerequisite for educational

sessions as is information about its process. Clinical scenarios should link evidence-based material to everyday practice. Clinical benefits were more acceptable reasons for GPs to choose a drug than cost-effectiveness. Clinical autonomy seemed to be essential for GPs' professionality and needs further exploration whether or how it conflicts with agreement on treatment according to guidelines. During the study, researcher found a special skill profile facilitator need during the group process.

Objectives

Researchers wanted to study the feasibility and acceptability of an educational intervention they called 'reflective practice'. They paid special attention to the group process and its barriers.

Context

Four practices in South West England were recruited, all of them experienced difficulties with appropriate prescribing patterns.

Intervention activities

Seven monthly sessions with prespecified topics took place in the middle of the day. Facilitators used the following structure: the facilitator shows a typical scenario (for instance a depressed man telling the GP about the symptoms); the scenario should engage the GPs in the patient's problem and not primarily in the medical management; the facilitator uses brainstorming to elicit possible responses and invites participants to suggest possible responses to the scenario. Participants write down what they would do on the basis of elicited responses and place it anonymously on a flip chart. The group chooses the 'best buy' response and identifies skill deficits and organisational barriers to its implementation. They define means to overcome barriers, for instance consultation strategies, availability of patient handouts, etc. Participants are

responsible for overcoming the identified barriers and they agree on the resources to overcome them. They check after three months whether they succeeded in implementing the change.

Main quantitative outcomes

Main qualitative outcomes

The main barriers were of logistical or attitudinal. Protected time is important so the group can meet at regular intervals. 'Top down experience' causes a tension and makes GPs feel unsafe. They feel that the managerial intervention threatens their clinical autonomy and interventions demanding consensus discussions.

Main Themes and Propositional Statements

- Introduction of the intervention

To deal with these issues (information overload), an initial, introductory session of 'Reflective Practice' needs to be included, where GPs' experience of previous prescribing management interventions can be aired, where safe 'rules of engagement' can be agreed, and the purpose of the 'reflective practice' intervention made explicit.

Outcome 1: addressing practitioners' needs

Mechanisms: sharing similar needs / size of group affects communication

To encourage GPs' engagement, all sessions took place over lunchtime, and a sandwich lunch was provided. GPs gained PGEA accreditation for their participation.

Outcome 2: forming and Norming the Group

Mechanisms: need for relatedness / need for autonomy

… much pressure about their prescribing budgets that they participated … as an attempt to appease their prescribing adviser. This resulted in poor attendance and a reluctance to participate …. This defeated the notion of reaching and establishing a consensus that was 'owned' by the practice as a whole…

…., it emerged that it could be difficult for GPs to match top-down initiatives with everyday practice. The difficulty, which is another form of pressure, was expressed well by one GP who explained in the interview.

The ways in which groups worked together in sessions seemed to be key to their success. ..., group members sometimes seemed to strive to demonstrate their personal high standards of patient care. ... the group challenged one such statement as unrealistic.

Responses to the intervention also depended on personal relationships within practices. Some GPs were uncomfortable challenging one another's clinical preferences. ... The practice soon decided to discontinue their involvement in the educational intervention, citing 'time pressures' and dissatisfaction with worksheets as reasons.

..., two practices have instituted a regular morning coffee break, which was described in positive terms as a discussion: "The indigestion ... has come up, and we have a coffee break and quite often discuss clinical things and some comments have come out about that."

The success of group learning between GPs within a practice depends to a large extent on the quality of relationships within the group. Where individuals feel that their management decisions are under threat from colleagues with whose judgements, they are not comfortable, discussion may be abruptly curtailed.

It became evident that the only environment in which this intervention could flourish was one that was safe and interesting but also enticing. Thus, those GPs who suspected that the intervention was an implementation of a top-down (PCT) initiative tended to resist it.

The concept of clinical autonomy is highly valued and it has been argued that in British general practice, prescribing is the principal battleground on which the cause of clinical autonomy is being defended.

An understanding of what GPs mean by clinical autonomy and how it affects their ability to reach explicit consensus on clinical management decisions is crucial if practice prescribing is to become more cost-effective. Many GPs perceive guidance on cost-effectiveness ... as an intrusion on their professional independence.

Outcome 3: exchanging experiences and failures

Mechanisms: need for competence and self-actualisation

Most participants stressed the benefits of the intervention for facilitating discussion, which was implicit in the design of the educational intervention. This seemed to counteract the convention of autonomous working practices by GPs, which can lead to professional isolation, even in partnerships.

Doctors saw videos as useful tools for stimulating discussions.

Outcome 4: identifying learning needs, planning actions, setting priorities and goals

Mechanisms: previous knowledge is activated / cognitive dissonance

The reluctance of GPs to appear in agreement with one another does not mean that discussions are pointless or ineffective. For example, as we found in an earlier study,12 the process of sharing different management strategies for a particular clinical problem may result in marked changes in prescribing behaviour.

Most surprising was the reaction to the presence of these texts (clinical evidence) during the educational sessions. The researcher observed that GPs seized on the books with gusto when the facilitator brought them into view.

Outcome 5: creating the learning environment

Mechanisms: social learning

Outcome 6: seeking solutions and adaptions, creating new knowledge

Mechanisms: interdependence between insurers and QCs / interdependence among group members

… GPs and facilitators pointed to the difficulty of reaching consensus on a best buy, ……. Some found the term 'off-putting' because of its financial connotations. This suggests that some GPs may feel that their management decisions should be based on wider considerations than those of cost-effectiveness.

The structure of each session demanded a firm commitment ... to a common management strategy for …, we found that GPs were reluctant to do this. This reluctance appeared to arise from a sense of threat to their perceived need for clinical autonomy — ….

…. draws on 'the theory of planned behaviour' and other studies that have identified the pre-requisites of successful behaviour change in general practice reviewed by Veninga et al.2000

Outcome 7: systematic Use of new knowledge

Mechanisms: repetition priming and automaticity

Contextual levels

- The level of the individual (capabilities and motivations)
- The group level (the group and the facilitation process)

…originally intended that this pharmacist would facilitate the sessions, as a means of enhancing his role. As he was not available at the time of study, six different facilitators from a variety of disciplinary backgrounds … were recruited to facilitate the sessions.

… facilitation skills and aptitude were ... important … …. As one of the GPs commented …: "I think the person's much more important than their background." A facilitators' ability to manage a group successfully was central. … a good facilitator should "… whipping us into line."

The ability of the facilitator to manage group discussions, especially their ability to create an atmosphere that was non-threatening and supportive. At the same time, good facilitators were able and willing to challenge the group when members colluded with one another to evade potentially contentious issues.

The respect of the group for the facilitator was crucial to the success of the intervention. Facilitators needed to be grounded in a sound knowledge of prescribed medicines, but also needed to have group facilitation skills.

- The organizational level (e.g., within a network that provides primary health care)

It was difficult to arrange the educational sessions at times when both GPs and facilitators were available.

To ensure attendance in the future, the educational sessions need to be protected by the use of a paid locum, in the same way as other practice development work is now being supported.

- The national bureaucratic level (e.g., the Federal Office Public Health or similar administrative body)

GPs were also unlikely to take part if they felt that the sessions would make them feel unsafe or if they felt that the sessions were yet another 'top-down' managerial intervention, where the main intention was to reduce prescribing costs.

Theories

The intervention draws on 'the theory of planned behaviour' and other studies that have identified the pre-requisites of successful behaviour change in general practice reviewed by Veninga et al.

Awareness that a problem may exist in one's practice

Understanding what causes the problem

Credibility of the source of information about new ways of managing the problem

Open acknowledgement and discussion about individuals' doubts about the new ways of managing the problem

Recognition that social force may accelerate acceptance of a new change in practice

Identification of barriers to implementation of the new change in practice

Identification and implementing ways of overcoming these barriers

Other areas: South African CPD groups: quality circles in other areas

Project Identifier: South African CPD groups

Topic: CME/CPD evaluation of a project (de Villiers et al., 2003)

Location: South Africa

Dates Covered: 2003

Overview

This paper is an evaluation of a model of CPD using facilitated small groups in South Africa. The School of Public and Primary Health Sciences in Typerby introduced it because traditional lecture-based models put too much emphasis on acquisition of CME/CPD credits and not on learning effects. Each small group of up to 12 participants met with a facilitator who was an expert on the topic, 2 hours a month for three months. three sequential small group programmes were offered covering the period of 9 months. Facilitators applied the principles of the Adult Learning Theory. Participants reported improved knowledge and skills.

Objectives

The objective of the CPD activity in small groups was to involve participants as active learners and help them improve knowledge and technical skills. The paper describes how the survey was developed using Nominal Group Technique and the results of the survey.

Context

CPD activity in facilitated small groups in South African PHC

Intervention activities

Experienced based learning according to the Adult Learning Theory

Main quantitative outcomes

91% of the respondents indicated improved knowledge, 73% indicated improvement in their patient care and 61% improved clinical skills.

Main qualitative outcomes

Participants also reported enhancement of professional judgement, improved contact with colleague's personal growth and change attitudes

Main Themes and Propositional Statements

Introduction

A more structured introductory meeting that would assess participants' learning needs, negotiate the future content of the small group meetings, seek agreement on learning agenda, dates, times and venues, establishing communication channels and explicitly discussing the educational rationale.

Outcome 1: addressing practitioners' needs

Mechanisms: sharing similar needs / size of group affects communication

The brief qualitative responses indicated that participants chose to join the small groups mainly because …there is a better rapport between the individuals and one gains more than just attending a lecture.

Outcome 2: forming and Norming the Group

Mechanisms: need for relatedness / need for autonomy

Outcome 3: exchanging experiences and failures

Mechanisms: need for competence and self-actualisation

Their expectations were mostly met as they found the time to ask questions and learn from both specialist and colleagues' opinions and knowledge'. They found the time spent on clarifications, discussions and questions very useful.

Outcome 4: identifying learning needs, planning actions, setting priorities and goals

Mechanisms: previous knowledge is activated / cognitive dissonance

Outcome 5: creating the learning environment

Mechanisms: social learning

Participants and facilitators saw the strength of the small groups as facilitating the learning of practical skills (e.g. through the use of role play).

Outcome 6: seeking solutions and adaptions, creating new knowledge

Mechanisms: interdependence between insurers and QCs / interdependence among group members

Outcome 7: systematic Use of new knowledge

Mechanisms: repetition priming and automaticity

Contextual levels

- The level of the individual (capabilities and motivations)
- The group level (the group and the facilitation process)
- The organizational level (e.g., within a network that provides primary health care)
- The national bureaucratic level (e.g., the Federal Office Public Health or similar administrative body)

Theories

Effective groups should follow the principles of Adult Learning and:

build on previous experience and prior knowledge and determine the perceived learning needs of the participants. Be participatory and actively involve learners. For example, by group work, practical tasks, problem solving, interviews and discussion.

Be focused on problems. Problems can be presented to the group by the participants or created by the facilitator based on real patients from clinical practice.

Be immediately applicable in practice. Learning should be relevant, realistic and take account of the participant's primary care context.

Involve cycles of action–reflection. The spaces in between the meetings can be used for practical action and observation and the meetings for reflection and consolidation of the learning.

Allow acquisition of technical skills. The small size of the group should allow observation, simulation or practice of technical skills.

Other areas: Australian quality circles

Project Identifier: small group based educational programme

Topic: cognitive behaviour therapy (Murrihy et al., 2009)

Location: Australia

Dates Covered: 2009

Overview

In Australia, researchers used a small group based educational programme to introduce cognitive behaviour therapy among GPs. They repeatedly practised their new skills in their groups during a period of 6 months. they established mentoring relationships, had skill based training and ongoing discussion of actual patients. The training model lead to increased knowledge and use of cognitive behaviour therapy skills.

Objectives

To introduce cognitive behaviour therapy skill among Australian GPs

Context

In Australia, small groups of 5-6 GPs met regularly for 2-hour sessions to learn cognitive behaviour therapy skills.

Intervention activities

It was an expert-led education with the opportunity of establishing mentoring relationships. Participants could discuss actual patients and repeatedly practice their skills in the group.

Main quantitative Outcomes

The training model lead to increased knowledge and use of cognitive behaviour therapy skills

Main qualitative outcomes

Main Themes and Propositional Statements

Outcome 1: addressing practitioners' needs

Mechanisms: sharing similar needs / size of group affects communication

Outcome 2: forming and Norming the Group

Mechanisms: need for relatedness / need for autonomy

Outcome 3: exchanging experiences and failures

Mechanisms: need for competence and self-actualisation

Doctors are unable to discuss patient cases in an ongoing fashion and are unlikely to develop mentor-type relationships with expert facilitators. Despite the popularity of this training model (education in seminars) the literature has consistently found that these brief, massed training sessions are insufficient to facilitate competence in CBT.

Relevant factors identified in effective training initiatives include: the use of distributed practice techniques; the development of mentor-type relationships; the use of interactive learning and skills-based training, and the use of a format which enables doctors to discuss ongoing patients.

Outcome 4: identifying learning needs, planning actions, setting priorities and goals

Mechanisms: previous knowledge is activated / cognitive dissonance

Outcome 5: creating the learning environment

Mechanisms: social learning

Outcome 6: seeking solutions and adaptions, creating new knowledge

Mechanisms: interdependence between insurers and QCs / interdependence among group members

Outcome 7: systematic Use of new knowledge

Mechanisms: repetition priming and automaticity

In principle, material learnt in brief training workshops decays quickly over time, whereas repetition on many occasions ensures greater retention.

Contextual levels

- The level of the individual (capabilities and motivations)
- The group level (the group and the facilitation process)

Successful training, which include establishing small groups of trainees, led by expert facilitators, who meet regularly over extended periods of time to discuss cases and expand their CBT knowledge.

- The organizational level (e.g., within a network that provides primary health care)
- The national bureaucratic level (e.g., the Federal Office Public Health or similar administrative body)

Theories

Successful training includes establishing small groups of trainees, led by expert facilitators, who meet regularly over extended periods of time to discuss cases and expand their CBT knowledge.

Interestingly, this model is known as ‘clinical supervision’ in the mental health specialties and, although it has not been well researched, has played a significant role in the training of therapists.

Other areas: local quality improvement on Hawaii

Project Identifier: local quality improvement on Hawaii

Topic: local quality improvement vs centrally steered QI on Hawaii (Parker et al., 2007)

Location: Hawaii / US

Dates Covered: 2007

Overview

This qualitative study was about the comparison of locally and centrally managed health care QI within PHC. It is a randomised controlled trial using a qualitative approach. Field notes and interview data informed about participants’ perceptions, beliefs and experiences. The study also examined whether QI projects concerning depression succeeded and whether improvements lasted. The local and central approach seemed to work as means for QI. Under favourable circumstances the local approach fostered high levels of satisfaction, motivation and commitment among participants. It also fits well with the need of professional autonomy physicians. However, the local approach time consuming and demanding for participants. Central expert leaders could enjoy being creative without having to bother about implementation. Some health care professionals appreciated expert inputs because it saved time and efforts. the authors propose a combination of the approaches where experts provide an evidence-base blueprint which participants can adjust locally and implement it in their practice.

Objectives

To compare the participatory local and central expert approaches to QI in depression care

Context

Health organisations on Hawaii, US, providing PHC, compared locally and centrally steered QI programmes to examine sustainability of the intervention and participants' perceptions, beliefs and experiences.

Intervention activities

Use of local teams who implement QI programmes they developed for their clinics.

Main quantitative outcomes

Both centrally and locally steered QI programmes had a positive effect.

Main qualitative outcomes

The local approach may foster substantially higher levels of team motivation and commitment, and consequently better performance than the central approach. The success of the local approach may be vulnerable to local conditions such as interest level. The central approach may reduce burden of work for participants. It may also be more efficient and allow some standardisation across the health care organisation. A combined model that uses both central expertise and local participation might be the most effective.

Main Themes and Propositional Statements

Outcome 1: addressing practitioners' needs

Mechanisms: sharing similar needs / size of group affects communication

Physicians have raised similar concerns about threats to the autonomy of their profession ... It is within this context, a time of declining perceived autonomy for individual physicians, that we compare the participatory local and central expert approaches to QI.

Outcome 2: forming and Norming the Group

Mechanisms: need for relatedness / need for autonomy

… In addition to the pragmatic benefits of the local approach, participants also mentioned one psychological advantage: intrinsic reward. …the local approach might be rewarding because it promotes team camaraderie…. "It [the local approach] is more creative and it's fun ... I enjoyed it."

Outcome 3: exchanging experiences and failures

Mechanisms: need for competence and self-actualisation

Not surprisingly, they personally relished the level of participation that the local approach affords. It is possible that their high level of enthusiasm permeated the entire team. In fact, every person on this team reported enjoying the opportunity to participate at a high level on this project.

Potential advantages of the local approach: it promotes buy-in, maximizes fit to local culture and circumstances, maximizes the ability to work out the details associated with implementation, and produces a highly rewarding experience.

Outcome 4: identifying learning needs, planning actions, setting priorities and goals

Mechanisms: previous knowledge is activated / cognitive dissonance

Next, they examined empirical evidence concerning the validity of these solutions. To facilitate this process, teams had access to the large resource library that the research team had assembled.

Outcome 5: creating the learning environment

Mechanisms: social learning

Outcome 6: seeking solutions and adaptions, creating new knowledge

Mechanisms: interdependence between insurers and QCs / interdependence among group members

…. Specifically, we suggest that centrally organized experts make the strategic decisions about best practices based on evidence but local site staff members make tactical decisions about how best to implement the plan based on what fits local circumstances, needs, and cultures ….

… interrelationships that exist among a particular organization's technologies, tasks, goals, stakeholder characteristics, and environment …. Participation provides one of the best methods for obtaining valuable information about ... local conditions.

Potential advantages of the local approach: it promotes buy-in, maximizes fit to local culture and circumstances, maximizes the ability to work out the details associated with implementation, and produces a highly rewarding experience.

Outcome 7: systematic Use of new knowledge

Mechanisms: repetition priming and automaticity

Contextual levels

- The level of the individual (capabilities and motivations)
- The group level (the group and the facilitation process)

Assisted by a trained facilitator, team members analyzed current practices to identify problem areas and then used participatory techniques such as brainstorming (Hackman & Wageman, 1995) to find solutions for the problems they had identified.

- The organizational level (e.g., within a network that provides primary health care)

Participation, …, does not come without costs. …, it is time consuming, …. For clinicians, who often see patients continuously throughout the day, it can be especially difficult to find time to participate in QI efforts.

… substantial organizational resources …. …, including tools that the QI teams could use to develop their programs and the costs of the local approach facilitator. … HealthOrg covered some but not all of the time that participants spent outside of formal meetings, …

- The national bureaucratic level (e.g., the Federal Office Public Health or similar administrative body)

Theories

Other areas: peer review groups in New Zealand

Project Identifier: peer review groups in New Zealand

Topic: prescribing patterns (Richards et al., 2003)

Location: New Zealand

Dates Covered: 2002

Overview

The New Zealand Independent General Practitioners' Organisation was concerned about the poor uptake of evidence into clinical practice among GPs. They had already implemented some strategies like academic detailing and audit and feedback strategies. In this pilot study involving 51 GPs, they set up a small group education programme to promote rational prescribing. The key aspect of the programme was small group work involving a steady group of around 10 GPs in each of the four groups. They meet once a month. They considered their laboratory and prescribing data in the light of evidence-based material and used a consensus approach. the effect was a statistically significant improvement of prescription patterns compared to GPs who only received academic detailing and audit and feedback.

Objectives

To improve prescribing patterns

Context

Four steady groups of around 10 GPs met once a month.

Intervention activities

Peer led discussions in order to reach consensus about clinical practice using own data and evidence-based material

Main quantitative Outcomes

A statistically significant, positive effect most measured outcomes in education strategy in groups compared to the combination of audit and feedback and academic detailing and evidence-based material.

Main qualitative outcomes

Main Themes and Propositional Statements

Outcome 1: addressing practitioners' needs

Mechanisms: sharing similar needs / size of group affects communication

There is significant interest in using CME to promote rational prescribing amongst GPs. Two influences appear to drive this: (i) wide variation in prescribing practice; and (ii) a desire to minimize unnecessary expenditure of finite resources.

The importance of a needs-identification process and the involvement of the programme user group in this process have been identified as crucial factors in the success of any effective learning programme.

Outcome 2: forming and Norming the Group

Mechanisms: need for relatedness / need for autonomy

The key aspect of the education strategy is clinical practice education groups (CPEGs) (Box 1). These are groups of ~10 GPs who meet monthly to discuss topics related to clinical practice. Group membership was constant and members of the same practice were grouped together where possible.

Outcome 3: exchanging experiences and failures

Mechanisms: need for competence and self-actualisation

Outcome 4: identifying learning needs, planning actions, setting priorities and goals

Mechanisms: previous knowledge is activated / cognitive dissonance

Discussion is based on evidence-based topic notes prepared for each leader as well as individual prescribing and laboratory data related to the topic that is provided to each GP. Although the education groups cover all aspects of clinical practice, ...

Topic identification is collaborative, end-user driven and uses local data, literature review and input from small group members.

Discussion is based around: evidence-based literature search. Audit and feedback of relevant individual prescribing and laboratory data provided to each GP all aspects of clinical practice.

Outcome 5: creating the learning environment

Mechanisms: social learning

Outcome 6: seeking solutions and adaptions, creating new knowledge

Mechanisms: interdependence between insurers and QCs / interdependence among group members

Outcome 7: systematic Use of new knowledge

Mechanisms: repetition priming and automaticity

These results demonstrate the need to look at repeating/reinforcing messages at 12–24-month intervals.

This study shows that a peer-led small group education process is a useful strategy for effecting changes in prescribing in general practice, and that these changes are sustained over time against a background of ongoing monthly meetings on new topics.

Contextual levels

- The level of the individual (capabilities and motivations)
- The group level (the group and the facilitation process)

Each group is led by an experienced GP

- The organizational level (e.g., within a network that provides primary health care)
- The national bureaucratic level (e.g., the Federal Office Public Health or similar administrative body)

Theories: -

Appendix 8.2 CMO configurations across clusters and articles

Context mechanism outcome configuration 1: 'participants know what to expect'

If the introductory workshop teaches the principles of QI in PHC and illustrates how QCs work (C), then potential members may be more willing to join QCs (O) because they know what to

expect and may feel that they can meet expectations(M).

The introduction strategy included a meeting with all staff in which the model was explained, a manual on theoretical and practical backgrounds of the model; support in the use of the model and the start of a first improvement project; a one-day course on quality management …. (Geboers et al., 1999).

This (small projects) seems to be in accordance with previous findings where improvement of the internal structure is often seen as the first step towards the full adoption of continuous quality improvement. It is sensible therefore to advise practices to start with this kind of improvement project (Geboers et al., 1999).

Our findings stress the importance of starting CQI with small, easy-to-handle projects (Geboers et al., 2001).

For CQI to be introduced successfully, a positive attitude toward CQI is required from all who will be working with it (Geboers et al., 2001).

(They) learned how to organise the meetings, how to guide the members of a peer group through the steps of the quality circle, and how to deal with group processes (Engels et al., 2003).

Introduction of the model … is important for understanding and helps participants during the start of the process. It was also vital to have a common and shared understanding of the problem among participants (Welschen et al., 2004).

In September 1992, 200 general practitioners and internists of a defined postal code area were contacted by the Kassel district office of the Kassenärztliche Vereinigung Hessen and invited to an information event [translated from German] (Szecsenyi et al., 1994).

It might be better to provide targeted information in advance of the project at an information event. This would make it easier for potential participants to decide for or against participating in the project, since questions as well as fears and reservations can be clarified immediately [translated from German] (Andres et al., 1997).

Surveys have revealed far-reaching gaps in information, some of which are the cause of misunderstandings and misjudgements. In particular, the working methods and objectives of medical quality circles are apparently insufficiently known. Better general information on this subject, which contracted doctors in particular, expect from their KV (health insurance company), is therefore urgently needed. As examples from the Netherlands and Great Britain show, active information from the target group is a basic prerequisite for quality-enhancing measures in practice [translated from German] (Beyer et al., 1999).

Introduction of the model … is important for understanding and helps participants during the start of the process. It was also vital to have a common and shared understanding of the problem among participants. It is worthwhile taking the time for an agreement on shared guidelines ……. (Welschen et al., 2004).

To deal with these issues (information overload), an initial, introductory session of 'Reflective Practice' needs to be included, where GPs' experience of previous prescribing management interventions can be aired, where safe 'rules of engagement' can be agreed, and the purpose of the 'reflective practice' intervention made explicit (Watkins et al., 2004).

A more structured introductory meeting that would assess participants' learning needs, negotiate the future content of the small group meetings, seek agreement on learning agenda, dates, times and venues, establishing communication channels and explicitly discussing the educational rationale (de Villiers et al., 2003)

Context mechanism outcome configuration 2: 'need for autonomy and obligation''

If the administration at the national level or at the level of health insurance companies entrusts GPs with QI and autonomy (so they can decide how to do it) (C), then GPs might participate in QCs (O) because they feel they can take on the responsibility and make a difference (M).

Social Law Code has given new impetus to the obligation of the associations of statutory health insurance physicians to implement quality assurance measures. As early as 1991, the board of the Kassenärztliche Vereinigung decided to introduce nationwide quality circles as an instrument of quality assurance in outpatient care [translated from German] (Szecsenyi et al., 1994).

In January 1993, the Association of Statutory Health Insurance Physicians in Southern Baden constituted an interdisciplinary working group with the aim of developing the organisational and conceptual framework for the establishment of quality circles in the Southern Baden region [translated from German] (Tausch et al., 1995).

The participants expressed their fears that participation in the quality circle could lead to possible regulation by KV or health insurance companies [translated from German] (Andres et al., 1997).

The respondents are suspicious of an obligation for all physicians to participate in quality assurance measures. In Saxony-Anhalt in particular - as shown by the clear statements made by those surveyed - this scepticism is linked to the consideration that a commitment to quality assurance measures would be more acceptable if it also affected those colleagues who refrain from continuous medical education training [translated from German] (Beyer et al., 1999).

In 1993, the health structure law ('Gesundheitsstrukturgesetz') added more specific recommendations to the existing body of rules about quality assurance with the explicit aim to stimulate quality assurance programs (quality circles) in primary and hospital care (Aubke et al., 2003).

The participation of German GPs in QCs is mandatory in order to be part of government-funded disease management programs (DMPs) or to be part of pilot projects with health insurance funds (Vollmar et al., 2010).

Furthermore, some differences between the regions could be observed. In region 1 the impact seemed highest, which may be explained by the activities of the Association of Statutory Health Insurance ('Kassenarztliche Vereinigung') in that region regarding continuing professional education (Wensing et al., 2009).

Research evidence showed that budget constraints could reduce prescribing volume and costs (14 Sturm H 2007) (Wensing et al., 2009).

In the discussion with facilitators, the QC participants expressed their desire to be self-determined and work independently. For this reason, the Federal Association of Statutory Health Insurance Physicians (KBV) and the Associations of Statutory Health Insurance Physicians (KVen) have laid down the thematic and methodological autonomy of QCs as a prerequisite in their guidelines for quality circle work and have committed themselves to supporting them [translated from German](Siebolds et al., 2012).

Context mechanism outcome configuration 3: 'sharing similar needs'

If the administration at the organisational level of QCs provides administrative support (i.e. for training facilitators, data gathering, provision of evidence-based information), and the administration protects time and space, and offers CME points, and small financial incentives to QC participants (C), then they will meet in groups to exchange ideas (O) because GPs prefer learning in QCs (M); support generates positive expectations among participants (M) and GPs think QC meetings with their peers will be useful (M).

contextual features at the organisational level:

With a restricted although realistic budget, facilitation should be set up as efficiently and effectively as possible (Geboers et al., 1999).

We have a very busy schedule most of the time, leaving little or no time for extra work (Geboers et al., 2001).

It was mainly a logistics problem. We have little room in practice (Geboers et al., 2001).

We already had so many meetings and we have so many tasks to fulfil. I work in a health care centre (Geboers et al., 2001).

I have often postponed things knowingly. Sometimes the bucket just overflowed (Geboers et al., 2001).

Staying close to the needs and expectations of the practices could be a way to introduce continuous quality improvement more effectively (Geboers et al., 1999).

We also found that the available time and possibilities to plan activities well were felt to be the most important barriers to using the CQI model (Geboers et al., 2001).

When there are great obstacles to change (e.g. limited time, the need to acquire a new skill), the group might decide to set aside time to specifically address strategies for overcoming these barriers (Armson et al., 2007).

As a discussion platform, we developed special facilitator manuals according to a uniform didactic concept. It includes relevant clinical portraits (sleep disorders, back pain, upper abdominal pain, heart failure, etc.) in general practice. These materials provide the facilitators with guidance and make it possible to stimulate and supplement the problem-oriented discussion of the diagnostic and therapeutic procedure at critical points. ...In our opinion, the advantage of this approach is that it makes it easier to get started with concrete quality circle work and that quality circles can be implemented on a broad basis [translated from German] (Tausch et al., 1995).

External support should help with the administrative organisation of QCs, as this exceeds the time capacity of the facilitators [translated from German] (Beyer et al., 1999).

The majority of respondents (85%) [HB: 87.1%] want or even urgently demand support for quality circle work from their Association of Statutory Health Insurance. In Saxony-Anhalt, the vast majority of respondents want both organisational support (e.g. by making rooms available, making contacts and making those contacts available - "start-up on site" - and granting reimbursement of expenses) and content-related support (e.g. by providing materials, topic recommendations, arranging speakers). In Bremen, primarily organisational support is expected [translated from German] (Beyer et al., 1999).

The fact that all groups are led by recognised (i.e. trained) facilitators speaks for the existing structural quality. The high level of continuity and frequency of participation also suggests that structural conditions such as accessibility, suitable conference room and location, clear scheduling, etc. are in place [translated from German] (Andres et al., 2010).

In some cases, the KVs took different approaches, for example by organising external facilitator training courses, developing special structure of QC meeting or supervision of facilitators [translated from German] (Siebolds et al., 2012).

In addition, long-term maintenance of small groups implies a national support for CME in general practice with enough personnel and economic resources to assist all those GPs who have key roles in providing CME at the local level (Eliasson and Mattsson, 1999).

Participation, ..., does not come without costs. ..., it is time consuming, ... For clinicians, who often see patients continuously throughout the day, it can be especially difficult to find time to participate in QI efforts (Parker et al., 2007).

... substantial organizational resources ...., including tools that the QI teams could use to develop their programs and the costs of the local approach facilitator. ... HealthOrg covered some but not all of the time that participants spent outside of formal meetings, ... (Parker et al., 2007).

Staying close to the needs and expectations of the practices could be a way to introduce continuous quality improvement more effectively (Geboers et al., 1999).

The peer groups met on a regular basis according to their needs (Engels et al., 2003).

...as a so called "clinical theme-course", which will give the participants important CME credits (Straand et al., 2006)

In Norway, specialists in general practice must renew their clinical specialty every five years. In this renewal process, participation in a number of peer CME group meetings are compulsory, in order to stimulate a continuously medical education and reflection (Gjelstad et al., 2006).

CME group members earned CME points to renew their speciality (Frich et al., 2010).

General practitioners (GPs) favour learning environments such as reading journals, discussion with colleagues, and participation in quality circles (Frich et al., 2010).

GP specialists have to renew their specialty every 5 years. Recertification demands participation in a number of peer CME group meetings. Typically, a peer CME group comprises seven or eight GPs who set up their own educational programme for monthly evening meetings (Rognstad et al., 2013).

The strategy also fts in well with the work setting of many GPs in European and non-European countries, which are often characterised by small practices, relatively isolated settings and a desire for more contacts with peers (Verstappen et al., 2004c).

The innovative, multifaceted strategy for improving test ordering behaviour was favourably evaluated by a large GP population. All local GP groups expressed a desire for continuation of the meetings after the experiment (Verstappen et al., 2004c).

GPs appreciate the combination of individual feedback, discussions about guidelines and small group quality improvement meetings driven by peer influence (Verstappen et al., 2004c).

Success rates of specific strategies seem to be strongly influenced by the extent to which they fit in with the local and organizational context and the physicians' day-today work routines (Verstappen et al., 2004a).

The first success was the easy recruitment, with practice groups eager to participate in the trial (Verstappen et al., 2004a).

…these groups of professionals practising in the same region meet regularly to discuss treatment, pharmacotherapy, and patient management (van Eijk et al., 2001).

We have also arranged for CME credits, needed to fulfil the educational requirements of ongoing licensure (Peloso and Stakiw, 2000).

General practitioners can discuss topics relevant to day-to-day practice. They get access to a local expert … l. Since topics come out of their own and their peers' practices, and are discussed by the expert, it is more likely that perceived and unperceived needs will be addressed (Peloso and Stakiw, 2000).

…that a small group format might be more attractive than other forms of CME, since this has been our experience (Peloso and Stakiw, 2000).

This learning format may meet a need for practices that have protected learning time to enable them to use multi-professional group learning to its full advantage (MacVicar et al., 2006).

PBSGL enabled participants to compare their practice with that of their peers, and this was mentioned frequently as a very positive motivator in joining and continuing in the groups (Kelly et al., 2007).

…with surprisingly few opportunities to gauge themselves and their practice against their peers, and they have been found to value this opportunity highly (Kelly et al., 2007).

The most-cited reason for joining PBSGL … as the PBSGL format matched their preferred learning style. …. Keeping up-to-date in clinical practice was the second-most mentioned reason (Overton et al., 2009b).

The most significant outcome did not come from the evaluative data collected during the research; rather that both groups are continuing to meet more than six months after the pilot finished (Rial and Scallan, 2013).

PBSG enabled participants to compare their practice with that of their peers, and this was mentioned frequently as a very positive motivator in joining and continuing in the groups. This corroborates previous work which found this to be an enhancer for translating research into practice (Kelly et al., 2007).

The reasons for participation varied and ranged from overcoming the lone fighter situation in the practice, defining the image of the family doctor, possibilities and limits, to searching for practical solutions to everyday treatment problems [translated from German] (Szecsenyi et al., 1994).

The most frequently mentioned motives for participating in quality circles were practical help and exchange of experience (57 and 58 mentions) [translated from German] (Gerlach et al., 1995).

The vast majority of participants cite the collegial exchange of experience as the greatest motivating factor for working in a quality circle. The primary goal is to improve the collegial relationships. At the same time, the desire for more consensus in medical action and the improvement of skills in diagnostics and therapy is mentioned as a very important objective [translated from German] (Tausch and Harter, 1996).

The main motives for participating in quality circles were the expectation of practical help for one's own practice, inter-collegial exchange of experience, improvement of patient care and opportunities for self-reflection on one's own work as well as personal support. Competing time commitments and above all the fear of external controls were mentioned as obstacles to participation in quality circles [translated from German] (Beyer et al., 1999).

Quality assurance in outpatient care was considered necessary - even more so in Saxony-Anhalt than in Bremen [translated from German] (Beyer et al., 1999).

External staff should organise QCs as facilitators have too little time to do this [translated from German] (Beyer et al., 1999).

The summary makes it clear that the question of participation in a quality circle is primarily based on specific medical needs. Many physicians wish to receive practical assistance in their daily practice and wish to overcome the structurally dependent professional and emotional isolation through intercollegial exchange. The most important goal is therefore personal support [translated from German] (Beyer et al., 1999).

Overall, more than 86% of the participants were (very) satisfied with the work in the quality circle. In contrast, only 2.8% were dissatisfied and 0.4% very dissatisfied [translated from German] (Andres, 2004a).

For almost all participants (97.1 percent), the desire to analyse their own prescribing behaviour and to optimise it with the help of the prescription data evaluation of colleagues was at the top of the list. The exchange of experience with colleagues and the expansion and refreshing of knowledge regarding pharmacotherapy were also considered important [translated from German] (Andres, 2004b).

Data from older surveys showed that family physicians indicated colleagues most often as information sources, followed by journals and books…. The most important requirements for media in medical education as perceived by the participants were its relevancy for daily practice and dependability (Vollmar et al., 2009).

... we ... predict that German general practitioners ... favour the "classical" learning environments such as: journals, colleagues, and quality circles. journals and books. ... exchange ideas and discuss actual trends with colleagues collegial and interactive rather than to meet experts ... (Vollmar et al., 2009).

The second key area of expectation was with the promotion of collegial exchange: more than conventional further-training events, quality circles assumed that a special form of group work by doctors would be a way of overcoming isolation in the private practice [translated from German] (Beyer et al., 1999).

To ensure attendance in the future, the educational sessions need to be protected by the use of a paid locum, in the same way as other practice development work is now being supported (Watkins et al., 2004).

The workshop was based on a provincial learning needs assessment and data from focus groups of family physicians from each of the provinces to ensure the curriculum material would meet the needs of physicians across Canada (Ioannidis et al., 2007b).

One of the strengths of the programme is its adaptation to the needs of GPs and pharmacists [translated from French] (Bugnon et al., 2004).

GPs' participation in PPQC meetings is accredited by the association for their continuing education (Niquille et al., 2010).

when asked, GPs also express a need for drug information/education that is academic and not promotional (Lundborg et al., 1999b).

The participants were not offered any extra incentives, except for the education itself (Lundborg et al., 1999b).

Doctors learn best when they recognise the need for learning and when learning is self-directed (Eliasson and Mattsson, 1999).

Many studies have shown that small group sessions are one of the most popular and stimulating CME activities practised by doctors (Eliasson and Mattsson, 1999).

The idea of problem-based and self-directed learning from everyday practice, closely linked to quality improvement, seemed to appeal to many Swedish GPs and the CME programme was successively accepted by the majority of them (Eliasson and Mattsson, 1999).

A meeting attendance fee was paid to the GPs, €70/hour for a plenary meeting (with the consultants), €45/hour for a quality circle meeting (Riou et al., 2007).

The brief qualitative responses indicated that participants chose to join the small groups mainly because ...there is a better rapport between the individuals and one gains more than just attending a lecture (de Villiers et al., 2003).

The importance of a needs-identification process and the involvement of the programme user group in this process have been identified as crucial factors in the success of any effective learning programme (Richards et al., 2003).

Beginning in 2005, attendees received category-I CME credit (Summerton, 2004).

Context mechanism outcome configuration 4: 'need for relatedness'

If a steady group of members engages in socially enjoyable contact, led by a skilled facilitator who, e.g., introduces people to each other, opens discussions, and clarifies and summarises statements (C), then group members will get to know each other and decide on rules that they are willing to follow, building a safe environment based on trust (O) because members want to be among and to interact with equals (M).

The groups were different ... we thought that a group is a group and all we have to do is to run the scheme ...and then I experienced that groups have their own cultures. These groups have existed for a while, which we probably have to consider … (Frich et al., 2010).

Tutors did not consider themselves as "experts" but as "one of them"., Being open about their background as GPs was an agreed upon strategy, and tutors deliberately tried to avoid being perceived as experts: The tutors experienced that their own background was important for GPs' trust and acceptance (Frich et al., 2010).

Both tutors and GPs emphasised that a "good atmosphere" in the group, and "a sense of security" among group members was essential for an open and constructive discussion (Frich et al., 2010).

Membership in the peer review group has been stable over time because it is unusual for general practitioners (and their patients) to switch between groups (Welschen et al., 2004).

CME has focused on disseminating information, but it has become increasingly clear that acquisition of knowledge is less important in changing physicians' behaviour than the social context of learning. Habit and custom, the beliefs of peers, and social norms are the major determinants (McSherry and Weiss, 2000).

Sessions are generally held in the evenings with a meal (Peloso and Stakiw, 2000).

We estimate it took three to four sessions for the group to be comfortable with this process. Open discussions and debates then came more freely, and the group continued to gel (Peloso and Stakiw, 2000).

The need to maintain the appearance of competence may be more compelling than the need to learn. Several strategies …. First, we tried to create as relaxed an atmosphere as possible. We arranged tables in a circle, removed all barriers …, and held the sessions with a meal (Peloso and Stakiw, 2000).

The group and the interactive format are fun (Peloso and Stakiw, 2000).

Initially, problems with group functioning were anticipated, but they are … uncommon. Groups of various compositions function effectively in this particular small group environment. … heterogeneous groups might provide broader practice experiences and greater variety in potential solutions to practice problems… (Armson et al., 2007).

Participants liked the inclusive nature of the small groups and appreciated the egalitarian quality of the interaction within them (Kelly et al., 2007). [No hierarchy]

It didn't matter where we came from; Skye, Wick or Brora. It soon became clear that we were all in the same learning position. And those in Inverness and Aberdeen didn't have all the answers (Kelly et al., 2007).

When the expert comes in, learning stops. … The use of invited experts (invariably hospital-based consultants using a traditional didactic approach to learning) was seen as an anathema to adult learning and the small-group ethos (Kelly et al., 2007).

Members of both groups described the meetings as relaxed, friendly and informal. The facilitators played a crucial role in creating the atmosphere: …, it would seem that the group members also contributed to the positive climate (Overton et al., 2009b).

Reasonably quickly I relaxed. Everybody was keen to make it a success. The group opened up and there was a sense of calm. The positive atmosphere enabled members to be open about knowledge gaps and to ask questions (Overton et al., 2009b).

The two groups appear to be at different stages of development. Group 1 seems to have developed a strong sense of cohesion quite quickly compared to Group 2 (Overton et al., 2009b).

Interestingly, the stage of storming, which is characterized by interpersonal hostility and conflict, was not evident in either group (Overton et al., 2009).

Norming reflects the development of group cohesion, openness and emotional support. The positive social dimension enabled the group to perform – that is, to focus on the task at hand, with resulting effectiveness (Overton et al., 2009b).

To encourage GPs' engagement, all sessions took place over lunchtime, and a sandwich lunch was provided. GPs gained PGEA accreditation for their participation (Watkins et al., 2004).

..., two practices have instituted a regular morning coffee break, which was described in positive terms as a discussion: "The indigestion .. has come up, and we have a coffee break and quite often discuss clinical things and some comments have come out about that." (Watkins et al., 2004).

The success of group learning between GPs within a practice depends to a large extent on the quality of relationships within the group. Where individuals feel that their management decisions are under threat from colleagues with whose judgements, they are not comfortable, discussion may be abruptly curtailed (Watkins et al., 2004).

Most participants stressed the benefits of the intervention for facilitating discussion, which was implicit in the design of the educational intervention. This seemed to counteract the convention of autonomous working practices by GPs, which can lead to professional isolation, even in partnerships (Watkins et al., 2004).

(GPs) in non-academic settings have few safe and reliable forums where they can reflect and learn from the clinical dilemmas inherent in their work (Sommers et al., 2007).

"Being with colleagues" … yield four subthemes: (1) gaining renewal through reflection, (2) obtaining others' perspectives, (3) developing collegial trust, and (4) learning specific information/skills …. Over half of the respondents commented on time issues related to participation; a third saw time constraints as deterring attendance (Sommers et al., 2007).

They will facilitate the discussion …, based on the individual feedback reports, enabling participants to compare own prescription patterns ..... This will probably trigger discussion …, aimed at critical reflection towards own prescription strategies for elderly patients and facilitating disclosure of areas where individual improvements may be desirable (Straand et al., 2006, Gjelstad et al., 2006). [Facilitation]

Facilitators …. trained …. over approximately 20 training hours. Facilitators provided … opportunity for all participants to ask questions …. We … encouraged participants to discuss their …practice patterns. The facilitator …redirected conversations that moved off topic, calmed the skeptics, and encouraged quieter participants to share their personal experiences (Peloso and Stakiw, 2000). [Facilitation]

In the mature group, the facilitator's major role is to introduce the expert to the group and the process, and to provide some closure at the end of the meeting (Peloso and Stakiw, 2000).

… tasks of the facilitator are to focus discussion … to encourage the group to identify factors that ... hinder implementation of new knowledge … …. To successfully fulfil this role, facilitators ...establish a safe, supportive environment ... identify practice gaps and encourage the discussion of sensitive ... issues (Armson et al., 2007). [Facilitation]

The role of the facilitator has been recognised. He/she needs to be competent at many tasks including opening the discussion, clarifying, summarising, questioning, and devising strategies to improve group function (Kelly et al., 2007). [Facilitation]

There was widespread agreement that the principal requisites for a good facilitator were experience and competence in small-group skills. One facilitator identified another skill: 'You've got to be able to hold the tension between comforting and challenging (Kelly et al., 2007). [Facilitation]

The facilitators were also skilled in encouraging participation (Overton et al., 2009b). [Facilitation]

'I think you need a facilitator certainly need it for the donkey work of the, arranging the meeting and making sure everybody has the module (Cunningham et al., 2011). [Facilitation]

'It gives you licence to play devil's advocate as well and challenge people a bit more whereas if you were always doing that as just a group member, people might think you were just doing it to annoy them (Cunningham et al., 2011). [Facilitation]

Participants considered that one-to-one mentorship with an experienced or established PBSGL facilitator would be very beneficial. This was also suggested as a method to encourage members of existing groups to train as facilitators (Cunningham et al., 2011). [Facilitation]

Any anxieties that potential facilitators may feel, mainly the concern that a new group will be hard to form, or will be dysfunctional, – need to be discussed with potential facilitators before and during the initial training. Facilitators of such groups will need the most support … (Cunningham et al., 2011). [Facilitation]

In countries using PBSGL, national networks provide training for facilitators and supporting material for the groups (Armson et al., 2007). [Facilitation].

The facilitator is selected by the group (Armson et al., 2007). [Facilitation]

The reasons for participation varied and ranged from overcoming the lone fighter situation in the practice, defining the image of the family doctor, possibilities and limits, to searching for practical solutions to everyday treatment problems [translated from German] (Szecsenyi et al., 1994). [Facilitation]

Our group prepared the facilitators for their task in two one-day training sessions. They had to conduct a model quality circle and critically discuss their role based on a pre-developed manual. In the second training course, we taught them important basic knowledge of group dynamics and basic didactic skills for their role as a facilitator [translated from German] (Tausch et al., 1995). [Facilitation]

The vast majority of participants cite the collegial exchange of experience as the greatest motivating factor for working in a quality circle. The primary goal is to improve the collegial relationships. At the same time, the desire for more consensus in medical action and the improvement of skills in diagnostics and therapy is mentioned as a very important objective [translated from German] (Tausch and Harter, 1996).

The summary makes it clear that the question of participation in a quality circle is primarily based on specific medical needs. Many physicians wish to receive practical assistance in their daily practice and wish to overcome the structurally dependent professional and emotional isolation through intercollegial exchange. The most important goal is therefore personal support [translated from German] (Beyer et al., 1999).

1-2 doctors from each group took on the task of the facilitation. AQUA employees trained and supported them during the course of the project. They also prepared facilitation materials and provided organisational support [translated from German] (Andres, 2004a). [Facilitation]

The groups were moderated by a primary care physician, who had had a 2-day training on moderation of quality circles and who received supervision in about two sessions per year. One session per 1 or 2 months was planned (Wensing et al., 2009). [Facilitation]

For this purpose (tutor system to support the moderators) 50 experienced facilitators were trained as quality circle tutors, who have been responsible for the training and further training of facilitators since 2001. In 2002 the KV Westfalen-Lippe followed this concept and trained 30 tutors. The encouraging experiences from both projects led to the KBV introducing the concept at a federal level in 2003. Since then it has trained 116 tutors [translated from German] (Siebolds et al., 2012). [Facilitation]

In order to support the facilitators in the design of circle meetings, the KBV has developed structured didactic handouts for circle work, so-called quality circle manuals.... The materials are to be understood as recommendations.... [translated from German] (Siebolds et al., 2012). [Facilitation]

The (facilitator) training usually lasts two days, i.e. between eight and 16 hours, usually twelve hours. ... In all twelve KVs, the trainers use the Quality Circle Handbook and their manuals. Further training for facilitators usually takes place in one day and lasts between three and ten hours [translated from German] (Siebolds et al., 2012). [Facilitation]

The CQC facilitators were local family physicians recruited and trained specifically to lead study meetings. They were chosen by the CQC steering committee for their skills in facilitating small-group activities, their known interest in chronic disease management, and their involvement in continuing professional development (Ioannidis et al., 2007b). [Facilitation]

Before the meetings, train-the-trainer workshops were conducted to assist facilitators in their role as group leaders (Ioannidis et al., 2007b). [Facilitation]

Facilitators were local family physicians recruited to lead and initiate discussion at study meetings and were chosen because of their skills in small group facilitation and involvement in continuing professional development and were selected by the study's steering committee (Ioannidis et al., 2008). [Facilitation]

… facilitation skills and aptitude were ... important … …. As one of the GPs commented …: "I think the person's much more important than their background." A facilitators' ability to manage a group successfully was central. … a good facilitator should "... whipping us into line." (Watkins et al., 2004). [Facilitation]

The ability of the facilitator to manage group discussions, … to create an atmosphere that was non-threatening and supportive. … willing to challenge the group when members colluded with one another to evade potentially contentious issues (Watkins et al., 2004). [Facilitation]

The respect of the group for the facilitator was crucial to the success of the intervention. Facilitators needed to be grounded in a sound knowledge of prescribed medicines, but also needed to have group facilitation skills (Watkins et al., 2004). [Facilitation]

Context mechanism outcome configuration 5: 'need for autonomy and control'

If the group chooses its own topics and facilitator (C), then they will feel they own the QC (O) because their need for autonomy is satisfied (a feeling of being in control of their own behaviour) (M).

Tutors did not consider themselves as "experts" but as "one of them". Being open about their background as GPs was an agreed-upon strategy, and tutors deliberately tried to avoid being perceived as experts. The tutors experienced that their own background was important for GPs' trust and acceptance (Frich et al., 2010).

The extra benefits gained by using GPs instead of non-physicians as (facilitators) have also been reported in a Dutch study (Rognstad et al., 2013).

A final limitation, caused by the study design is the fact that the peer groups did not have the opportunity to choose their own topics, …. After reading and discussing the content of the workbooks the peer-review groups defined self-selected change objectives (Engels et al., 2003).

A bottom-up approach to CQI stands central, along with an active role for the practice team and the application of a clearly structured, stepwise problem-solving method to develop and implement the improvement plans (Engels et al., 2006).

it is crucial to the model that practice teams formulate goals for improvement and attempt to achieve these goals in small scale (Geboers et al., 1999).

Reasons that were reported most often included "the subject chosen was felt to be a problem or a bottleneck in practice management", "the practice wanted to implement the national guidelines (on that specific topic)", and "the outcomes of the audit report" (Geboers et al., 1999).

As practices were free to select their own topics for improvement and set their own objectives, the fact that the intervention group met a significantly greater number of self-defined improvement objectives than the control group is an important finding (Engels et al., 2006).

it consists of involving all staff, holding regular meetings on quality, designating a quality coordinator, and writing annual plans and reports on quality improvement (Geboers et al., 1999).

…. were willing to continue using the model, but were less positive about the quality cycle and preparing an annual report (Geboers et al., 2001).

(many physicians) …. felt that activities not directly related to practice work (Geboers et al., 2001).

The groups themselves generate topics for modules, with the subsequent module being authored by a GP (Armson et al., 2007).

Each group decided the frequency, timing and location of the meetings at the first introductory meeting. Each group also decided their preferred method for module selection (MacVicar et al., 2006).

The facilitator is selected by the group (Armson et al., 2007).

The same publication points out that GPs – due to the lack of therapeutic consequences – do not seriously wish to diagnose the illness (Vollmar et al., 2007).

The group established common criteria for carrying out an inventory of needs using a standardised form of documentation of the QC process [translated from German] (Szecsenyi et al., 1994).

This (negative) assessment (of QC work) could be an expression of resistance and reservations regarding the background of the project and gaining participants, and thus an implicit plea for voluntariness and self-determination as the most important characteristic of medical QC [translated from German] (Andres et al., 1997).

The main focus of our analysis is on the characteristics of successful quality circle work that can be derived from theory, as they are also laid down in the above mentioned quality assurance guideline: group constancy and continuity, experience-based work on self-chosen topics, collegial group climate and goal orientation towards quality promotion in one's own practice [translated from German] (Andres et al., 2010).

The participants of the circle determine the questions concerning the content themselves [translated from German] (Siebolds et al., 2012).

It is important for a learner to be in control of his or her learning process, to be motivated, and to perceive meaningfulness (Lundborg et al., 1999a).

At the beginning … GPs were induced to attend … with criticism. At first, … GPs participated somewhat reluctantly 'in order to avoid trouble', but over time most of them began to look forward to regular attendance and enjoyed … opportunity for an exchange … in a relaxed setting (Spiegel et al., 2012).

The rise of evidenced-based medical guidelines … decreases individual providers' autonomy. Physicians have raised similar concerns about threats to the autonomy of their profession …. It is within this context, … declining perceived autonomy for …. physicians, … we compare the participatory local and central expert approaches to QI (Parker et al., 2007).

Topic identification is collaborative, end-user driven and uses local data, literature review and input from small group members Groups are peer-led and membership is ...(Richards et al., 2003).

Context mechanism outcome configuration 6: 'size of the group affects communication'

If group size exceeds 15 (C), then interaction among group participants decreases (O) because participants cannot keep up with each other and follow all conversations (M).

All GPs participating in such peer groups, on average consisting of six to eight peers, located in southern Norway (Straand et al., 2006).

The mean group size was 7.4 ± 2.7 (Verstappen et al., 2004c).

Our group usually has 12 to 15 participants, an expert, and a facilitator. We are primarily composed of generalists and family physicians, but regularly invite a pharmacist and a representative from the sponsoring pharmaceutical company (Peloso and Stakiw, 2000).

Groups of 4 to 10 family physicians form a PBSG in their own communities, meeting for an average of 90 minutes once or twice a month at an agreed upon time and place, allowing time off for holidays and summer vacations (Armson et al., 2007).

How can QCs be supported? (Table 2) Group sizes > 15 or < 5 - are problematic and participants need support [translated from German] (Andres et al., 2010).

A maximum of 15 physicians in each geographical area were enrolled into each circle in the study (Ioannidis et al., 2008).

Thus, it is a stable and voluntary group of five to eight doctors who meet about five times a year with a pharmacist, expert and facilitator, in a context of interdisciplinary continuing education [translated from French] (Bugnon et al., 2004).

A quality circle is a stable group of 3–10 GPs with … 1 trained pharmacist. Pharmacists volunteer as facilitators and are responsible for motivating local GPs to participate. They … organize the practical … (e.g., rooms, agenda) and get the prescribing profiles of the participating GPs) (Niquille et al., 2010).

GPs had to join as groups; c) groups had to be pre-existing; d) the preferred group size was three to six (Lundborg et al., 1999a).

The effect of the educational asthma programme was partly modified by the group size; prescribing behaviour for (asthma) exacerbations improved more in smaller groups. The group size varied from 4 to 13 ……. This result is ……. an optimal group size of 5 to 6 group members (Veninga et al., 2000).

Although the optimum number of participants for quality circles is between eight and 10, when necessary, up to 16 per circle were allowed (Spiegel et al., 2012).

These are groups of ~10 GPs who meet monthly to discuss topics related to clinical practice. Group membership was constant and members of the same practice were grouped together where possible (Richards et al., 2003).

Context mechanism outcome configuration 7: 'feeling safe and not vulnerable'

If participants trust each other (C), then they can describe how they work and admit what they don't know (O), because they feel safe rather than vulnerable (M).

I was surprised to see how willing people were to reflect on their own behaviour and practice ... and constantly comment like: "Well, did I really do that? I surely have to pull myself together". Very strong will, apparently, to make changes (Frich et al., 2010).

GPs generally experienced the CME group as a safe setting to present and discuss their feedback reports: It would have been more embarrassing if it had been in a large lecture hall or a large seminar (Frich et al., 2010).

A shared understanding of the complex decision-making involved in prescribing in general practice was reported by both GPs and tutors as essential for an open discussion in the CME groups (Frich et al., 2010).

GPs generally experienced the CME group as a safe setting to present and discuss their feedback reports (Frich et al., 2010).

After a while, it may become less needed, because participants may then feel more safe about discussing their own behaviour within the group as a whole (Verstappen et al., 2004c).

…greater insights into and discussion of the physicians' own performance in a safe group of respected colleagues would be a powerful instrument to improve the quality of test ordering (Verstappen et al., 2004a).

What have you gained from participating in this practice-based small group learning project? small group support: the group works effectively together and as time progressed, I was able to participate more effectively as my confidence grew (MacVicar et al., 2006).

…. particularly when they involve participation in small peer groups that foster trust, promote discussion of evidence relevant to real cases and provide feedback on performance (Armson et al., 2007).

In time, group members develop confidence and security in the group, rendering the disclosure of ignorance and ''blind spots of knowledge'' easier. Group members could either use the whole group or parts of it to assess their own learning needs (Eliasson and Mattsson, 1999).

It became evident that the only environment in which this intervention could flourish was one that was safe and interesting …(Watkins et al., 2004).

GPs were also unlikely to take part if they felt that the sessions would make them feel unsafe (Watkins et al., 2004).

Context mechanism outcome configuration 8: 'need for competence and self-

actualisation'

If the facilitator supports participants and encourages them to tell their stories and share their experiences in a safe environment, e.g., by encouraging interactive responses, through discussions and by summarising statements, (C) then participants will be involved and share their positive experiences and failures (O) because they want to improve their professional competence, (M), gain professional confidence (M) and fulfil their professional potential (M).

…. that an improvement in prescription behaviour could be obtained in a group setting where the participants knew each other well and were used to discussing challenging topics related to their own clinical practices (Gjelstad et al., 2013).

Both GPs and tutors experienced that sharing the experience of being a GP contributed to an open and constructive discussion (Frich et al., 2010).

Reflective thinking increased among GPs; they were able to reflect their individual prescription habits in the CME group. Inappropriate results could put some GPs in distress in front of the group (Frich et al., 2010).

Another important topic of debate was how to deal with the frequent requests by patients to have inappropriate tests performed (Verstappen et al., 2003).

The decision to focus on clinical problems instead of tests was a good choice, since it allowed the feedback and group work to be linked to national evidence-based guidelines. GPs appreciated this approach, because it was also closely related to their everyday work routine (Verstappen et al., 2004c).

There is some empirical evidence that participating in quality circles may increase GPs' job satisfaction (Verstappen et al., 2004c).

Various members expressed a desire to keep up to date …. Others wanted to compare what they were doing with their peers, to confirm that they were practising safely …. Participants …stated that they wanted to be able to examine current evidence and to improve their critical appraisal skills (Kelly et al., 2007).

The need to maintain the appearance of competence may be more compelling than the need to learn. Several strategies …. First, we tried to create as relaxed an atmosphere as possible. We arranged tables in a circle, removed all barriers …, and held the sessions with a meal (Peloso and Stakiw, 2000).

The facilitator elicited interactive responses … with the aid of specific predetermined prompting questions and responses. The program participants resolved practice-based problems …. The best practices were determined by the group as a whole and conflict resolution was achieved with the mediation of the content expert, if required (Davis et al., 1999b).

The cases were regarded as not only appropriate but also reflecting practical problems in office practice (Davis et al., 1999b).

...the success of this format depends on availability of course material that reflects practice based clinical problems and on the important roles of specially trained facilitator (Davis et al., 1999b).

The ability to change practice is enhanced if skills are endorsed by trusted colleagues and supported by published literature, and there is opportunity for practice and feedback (Peloso and Stakiw, 2000).

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An interactive small group can prompt moderately large changes in physician practice (Armson et al., 2007).

..comparison with one's peers was important, as was the support, confidence and reassurance that some gained from being part of the group (Kelly et al., 2007).

I've gained more confidence because of spending time with these people. To go in [to PBSGL meetings], be with these fellow professionals, but it was completely calm, completely non-judgemental (Overton et al., 2009b).

We recognize that many personal, professional, and social forces affect attendance at CME beyond the format itself (Peloso and Stakiw, 2000).

Network (SIGN) on a variety of clinical and non-clinical topics. 'Modules are much better than SIGN guidelines because they are patient based and make you think about your own practice (Kelly et al., 2007).

...discussion of personal stories might help participants tackle any doubts they may have on individual cases, and it might also enable attitudes to be highlighted and perhaps modified, through hearing the views and beliefs of others. ..., the group members and the facilitator may .... offered each other educational support (Kelly et al., 2007).

Comparison with one's peers was important, as was the support, confidence and reassurance that some gained from being part of the group (Kelly et al., 2007).

Specific assistance and solutions for actual problems in their own practice are sought and willingly accepted. Finally, a decisive factor for the motivation to work in the case-oriented QZ is the emotional relief reported by all participants [translated from German] (Gerlach et al., 1995).

It became clear that one's own actions are influenced less by the appropriate clinical knowledge than by one's own experiences, attitudes, and interaction with patients [translated from German] (Szecsenyi et al., 1994).

Each participant described his or her own case of how a family doctor deals with their own sore throats or family members' complaints [translated from German] (Szecsenyi et al., 1994).

The possibility of overcoming isolation in one's own practice, a way out of isolation, as well as the experience that others have similar problems structurally and they are not different from anybody else, seems an emotional relief. Even more, the reawakening that medical action (e.g. active listening to blood pressure measurement) can be helpful and positive [translated from German] (Gerlach et al., 1995).

Exchanging experiences in QCs, GPs can work out and clarify the characteristics of the general practice, which improves knowledge transfer [translated from German] (Tausch et al., 1995).

By working within a QC, I have received more emotional support for my daily practice. The QC work should offer help with disputes/arguments and emotional relief when, comes to, for instance, very expensive therapies [translated from German] (Andres et al., 1997).

The basic message was that quality circles are necessary because they promote collegial cohesion more intensively than normal training events. It is extremely important for the individual to know that their colleagues share the same problems or experiences that he or she has [translated from German] (Murad, 1998).

....it would be easier to conduct a conversation (e.g. when dealing with desired prescriptions); a topic that is always relevant for different indication areas and where many people seem to have benefited from the exchange of experiences and the group discussion. Probably, they felt strengthened by the support from colleagues and the enhanced self-image as GPs [translated from German] (Andres, 2004a).

....in the sense of a continuous, systematic, goal-oriented, facilitated exchange of experience on the basis of specific everyday actions in practice [translated from German] (Andres et al., 2010).

At the first meeting the GPs discussed in groups how they diagnose the illness, and the underlying reasons they find important when deciding on treatment (Lagerlov et al., 2000).

Subjects, topics and cases discussed in groups come from daily work and are highly relevant to practice. The small group will meet the demands of developing generalist knowledge as well as the expert role in general practice (Eliasson and Mattsson, 1999).

Small groups will have opportunities to discuss the ''art of medicine'', founded upon context, anecdote, patient stories of illness and personal experiences. Accepting emotional responses being mirrored by other group members corresponds in some respects to the process in Balint groups (Eliasson and Mattsson, 1999).

The group should act as a forum where its members can reflect freely upon all problems that bind them together in their profession (Eliasson and Mattsson, 1999).

…GPs regard the group as a place for social support, ..., growth in the professional role …for protection against burnout. Although … main purpose of small group work is exchange …… of knowledge, social aspects should not be neglected because they will increase the motivation to continue with meetings (Eliasson and Mattsson, 1999).

The desire to be more competent and ''pride in performance'' are other key forces for change, while regulatory measures have little impact (Eliasson and Mattsson, 1999).

In addition, small group members have unique opportunities to discuss the way the individual patient experiences his or her illness through narratives, retold by the doctor (Eliasson and Mattsson, 1999).

The ways in which groups worked together in sessions seemed to be key to their success. …, group members sometimes seemed to strive to demonstrate their personal high standards of patient care. … the group challenged one such statement as unrealistic … (Watkins et al., 2004).

Their expectations were mostly met as they found the time to ask questions and learn from both specialist and colleagues' opinions and knowledge. They found the time spent on clarifications, discussions and questions very useful (de Villiers et al., 2003).

Relevant factors identified in effective training initiatives include: the use of distributed practice techniques; the development of mentor-type relationships; the use of interactive learning and skills-based training, and the use of a format which enables doctors to discuss ongoing patients (Murrihy et al., 2009).

With the collaborative learning of residency training no longer available, clinicians often adopt idiosyncratic approaches when they encounter patient-care situations that cause them to question the limits of their own knowledge, … how to distinguish between their own knowledge limits and that of the medical canon—…, clinical uncertainty (Summerton, 2004).

Social constructivist learning theorists, medical educators, and primary care researchers identify the problematic patient case as a powerful professional learning opportunity. Whether and how one decides to take on these problems in the "swampy lowlands" of practice become, according to Guest, decisions about "deliberate practice" (Summerton, 2004).

Context mechanism outcome configuration 9: 'previous knowledge is activated'

If participants exchange case stories and experiences while actively listening to each other in the presence of a skilled facilitator in a safe environment (C), then they will share their knowledge by telling their own relevant stories (O) because the process activates knowledge they already possess (M).

...an important element is the focus on daily, clinical GP problems. In our study GPs preferred to talk about clinical problems and tests linked to these problems, rather than to discuss abstract phenomena like total test ordering volume or the ordering of specific tests (Verstappen et al., 2004c).

The improvement strategy concentrated on 3 specific clinical topics (cardiovascular conditions, upper abdominal complaints, and lower abdominal complaints) and the tests used for these clinical problems, because it was believed that the physicians would prefer to discuss specific clinical topics rather than specific tests (Verstappen et al., 2004a).

The use of a case-based format encourages activation of previous knowledge, allowing better retrieval of knowledge in the clinical setting……. particularly when it involves participation in small peer groups that foster trust, promote discussion of evidence relevant to real cases and provides feedback on performance (Armson et al., 2007).

11/2- to 2-hour discussion period follows, in which one or two of our GP learners will present a case from their practice on the topic (Peloso and Stakiw, 2000).

Group members prepare cases from their office and present them in 3 to 4 minutes, to set the stage for discussion. …, we actively solicited group participation throughout the session. This encouragement was a major function of the facilitator early on (Peloso and Stakiw, 2000).

Participants were encouraged to bring their own cases in relation to the topic. In this group, members were given tasks at the end of the meeting and fed back on these at the next meeting (MacVicar et al., 2006).

The theoretical basis for changing practice begins with the individual physician's experience of patient care (Armson et al., 2007).

PBSG modules are designed to engage family physicians "in learning activities that are self-directed and related to authentic practice problems.... The cases, linked with important information, are the keys to stimulating discussion around patient care issues (Armson et al., 2007).

The aim is not to solve the presented problems, rather the problems should act as a stimulus to encourage the group members to identify, discuss and address cases from their own experience too (Kelly et al., 2007).

Virtually everyone participates in presenting a case, asking for advice or clarification, or describing their practice patterns (Peloso and Stakiw, 2000).

During discussions at the level of relationships (case discussion), the exchange is more intense than in the exchange of pure facts; one's own behaviour is better analysed and suggestions for training in one's own practice came up [translated from German] (Murad, 1998).

In each session, a colleague presented a difficult clinical case, which was discussed in the group according to a clearly structured manual, they sought solutions together and in the final phase, the group suggested a new treatment plan, which the presenting colleague had to try to implement in his practice [translated from German] (Murad, 1998).

By dealing with actual clinical cases, real difficulties in the participants' everyday practice become the subject of discussion in the quality circle instead of constructed problems. In systematic reconstruction, participants make the experiences conscious, so that intuitively applied - implicit guidelines can be made explicit [translated from German] (Gerlach et al., 1995).

Case discussions were by far the most popular agendas in groups (Eliasson and Mattsson, 1999).

Group work is built on sharing and improving ''collective'' knowledge and well-functioning groups provide this in an atmosphere of joy and curiosity (Eliasson and Mattsson, 1999).

Context mechanism outcome configuration 10: 'immediate relevance for the practice'

If QCs use the technique of experience-based learning (C), then knowledge becomes more relevant to GPs (O) because it relates to their everyday work and they can use it immediately (M).

...an important element is the focus on daily, clinical GP problems. In our study GPs preferred to talk about clinical problems and tests linked to these problems, rather than to discuss abstract phenomena like total test ordering volume or the ordering of specific tests (Verstappen et al., 2004c).

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Context mechanism outcome configuration 11: 'cognitive dissonance'

If participants discuss and reflect on their work processes (e.g., based on trustworthy data or personal experiences) during a professionally facilitated exchange of positive experiences or failures (C), then they discover knowledge gaps and identify learning needs and relevant topics (O) because their own attitudes and behaviours may differ from their peers', creating cognitive

dissonance a negative emotional state triggered by conflicting perceptions that makes them reconsider their own way of working (M).

The identification of suboptimal pharmacological treatments to be targeted in this study, was based on previous research and active reflection and discussions based on own clinical experience from general practice (Straand et al., 2006).

In the continuing medical education group setting, each participant was confronted with, and had to reflect on, the baseline report on their own prescription practice. We believe that this was a key component for obtaining improved prescription habits (Gjelstad et al., 2013).

We consider the key element in our study to be "What happens to a general practitioner's prescribing behaviour when he or she reflects on his/her prescriptions?" (Gjelstad et al., 2013).

Our intervention required general practitioners to expose their own antibiotic prescribing data in their continuing medical education group by using a structured pedagogical method, critically reflecting on the need for change together with an active listener (Gjelstad et al., 2013).

Academic detailing involves educational outreach visits and incorporates external audit and supervision, and has a larger effect on prescribing than dissemination of educational materials, audit or feedback alone (Frich et al., 2010).

Peer group academic detailing was experienced as a suitable method to learn more about pharmacotherapy, though there were participants who argued that the scheme was time-consuming (Frich et al., 2010).

GPs' "hits" for inappropriate prescriptions in the elderly, or an unfavourable antibiotic prescription profile, was the starting point for group discussions at the second meeting. Tutors reported that GPs tried to justify and explain their practice (Frich et al., 2010).

Our results are in concordance with research that suggests that GPs may feel disappointment if their prescribing practice conflict with their ideals (Frich et al., 2010).

One important outcome for the GPs was an experience of being more reflective in decision-making about prescriptions (Frich et al., 2010).

The older … were silent, because they had a prescription profile … far from … recommended. The young … dominated the discussion, and they were much more familiar with the guidelines … … the old felt distress when disclosing their profiles ... have repeated their errors for … decades. (Frich et al., 2010).

GPs were generally more embarrassed if they had hits they knew they should have avoided, such as prescribing flunitrazepam to elderly patients, compared to potentially harmful drug combinations that had not been highlighted in the recommendations (Frich et al., 2010).

The findings underscore that tutors have an important role in managing distress and contributing to an informal and relaxed atmosphere in peer academic detailing groups (Frich et al., 2010).

….and how to facilitate learning within a group setting (Rognstad et al., 2013).

Social interactions were used as an important motivator for change, as physicians learned how colleagues were handling test ordering problems and as they obtained information about the consequences of medical decision making in daily practice (Verstappen et al., 2003).

Personalized graphical feedback, including a comparison of each physician's own data with those of colleagues; dissemination of national, evidence-based guidelines, and regular meetings on quality improvement in small groups. The strategy focused on specific clinical problems and the diagnostic tests used for these problems (Verstappen et al., 2003).

The first was mutual personal feedback by peers, who worked in pairs at the start of the meeting. This was assumed to be a safe method of peer review (Verstappen et al., 2004c)

A second important element is the fact that GPs are prepared to discuss personal, transparent data openly in a group of colleagues (Verstappen et al., 2004c).

Compared with only disseminating comparative feedback reports to primary care physicians, the new strategy of involving peer interaction and social influence improved the physicians' test-ordering behavior. To be effective, feedback needs to be integrated in an interactive, educational environment (Verstappen et al., 2004a).

90-minute standardized small-group quality improvement meeting about 2 weeks later at which one of the clinical problems was discussed based on the feedback reports and the guidelines … In these meetings social influence, which was an important vehicle to reach improvement on test ordering (Verstappen et al., 2004a).

The second component was an interactive group education of national guidelines, to enable participants to relate their own and each other's test ordering behaviour with them (Verstappen et al., 2004c).

The new strategy utilised peer influence among GPs, and gave GPs the opportunity to openly discuss their test ordering behaviour with colleagues (Verstappen et al., 2004c).

They stated that this type of feedback definitely had added value, because comparison with colleagues made them more conscious of their own behaviour and motivated them to change. Their main criticism was the validity of the numbers of tests in the feedback and the absence of patient-related data (Verstappen et al., 2004c).

Participants were shown the overall data on prescribing of antidepressants in the past year to illustrate that most anticholinergic antidepressants are prescribed to people aged over 60…. During the second visit a graph was provided showing personal performance (van Eijk et al., 2001).

…all doctors received a summary of their group's guidelines by mail, and two months after the intervention they received the results of the baseline measurement (see outcome variables) to reinforce the consensus reached (Welschen et al., 2004).

Of the 40 GPs that reported having received individual feedback, 37 rated it as useful (Welschen et al., 2004).

The purpose is to enable the transfer of evidence into practice through the use of facilitated small groups, using presented cases to encourage reflection on individual practice (Kelly et al., 2007).

…it provides an opportunity to measure one's practice against that of one's peers. Direct, extended interaction with a local recognized... (Peloso and Stakiw, 2000).

It is a relaxed, enjoyable evening in a friendly environment. …. This exchange allows for clarifications and redirections, leading to learning for both GP and expert. It is also an opportunity for the expert to learn of the tremendous competence that exists within GP practice (Peloso and Stakiw, 2000).

Of greatest importance to GPs is the opportunity to measure their current practice patterns against that of their peers (Peloso and Stakiw, 2000).

Individualized feedback with specific recommendations, especially when combined with education, generally have been more effective than single intervention (Herbert et al., 2004).

One objective of the PBSG program is to encourage physician members to reflect on their individual practices and identify any gaps between current practice and the best available evidence. This is accomplished through discussion of real-life medical and patient problems in small groups of peers (Armson et al., 2007).

Through reflection, a gap between current practice and best practice is recognized. Distinguishing this gap presents an opportunity to identify learning objectives specific to the family practice setting (Armson et al., 2007).

Physicians who received feedback about personal prescribing or who used the PBSG process to discuss hypertension were more likely to change their prescribing than physicians in PBSG who reviewed a different condition. When feedback about personal prescribing was combined with the PBSG process, the effect … was even greater (Armson et al., 2007).

One of the key features of QCs is that working methods map the quality of care in one's own practice. First of all, this distinguishes QC work from further training in the classical style and second, it enables participants to identify real quality problems in their own practice [Translated from German] (Andres et al., 2010).

A systematic procedure …: data in the feedback report were studied …, reasons for variation were discussed, … prices of drugs, evidence underlying drug treatment was considered, typical patient cases from practice were analysed and finally objectives for improvement were formulated, and specific plans for improvement were made (Wensing et al., 2009).

With regard to taking a practical assessment of their own actions, some participants feared that they would only be burdened with additional work, but on the other hand they were also very curious to see what we were doing [translated from German] (Szecsenyi et al., 1994).

A case-related approach offers the opportunity to confront learned normative expertise and concrete actual action in one's own practice.....By comparing one's own perceptions and the viewpoints of other circle members, as well as by confronting assumed and real actions, e.g. by analysing video recordings, individual and collective defence strategies can become conscious. The deviations from one's own normative expertise and thus the problem of the implementation of existing theoretical knowledge into everyday practice become accessible for analysis [translated from German] (Gerlach et al., 1995).

A basic problem of continuing medical education is the well-known mismatch between individual, existing specialist knowledge and putting this knowledge into everyday practice.....Quality circles as a form of QI, which among other things also serves the purpose of continuing medical education, can improve this situation [translated from German] (Gerlach et al., 1995).

On the basis of documentation of one's own activities in daily practice (e.g. in the form of index card evaluations, video recordings, EDP extracts, documents that one has created oneself, etc.), it is possible to learn from your own actions [translated from German] (Gerlach et al., 1995).

They (the modules) are didactically structured in a way that allow comparisons of systematic processes with the actual procedures in practice. This stimulates the participants and the principle of cooperative learning can be realised.... The participants should identify, name and document deviations from their medical actions. This also includes checking whether documentation and data material is available [translated from German] (Tausch and Harter, 1996).

The aim of the project was to make doctors' own prescription behaviour transparent and to highlight problem areas [translated from German] (Andres et al., 1997).

Presentation of these predefined guidelines was meant to encourage the participating doctors to assess their own performance and to foster discussion and refinement of the moderator-manuals (Aubke et al., 2003)

GPs see QCs on pharmacotherapy as a sensible and useful measure for optimizing their own prescription methods. They regard part 1 of the prescription mirror as the most important instrument of the quality circle work (i.e.: the feedback of one's own, specially prepared prescription data with the possibility to compare oneself with colleagues of the project group as well as a GP control group without intervention) [translated from German] (Andres, 2004a).

Quality circles comprise a practice-base strategy to improve professional performance, which is based on meetings in small groups of health professionals, provision of evidence-based information, written feedback on professional performance and exchange of best practices in improving patient care (Wensing et al., 2009).

The intervention comprised of quality circles of primary care physicians, including repeated feedback on prescribing patterns … nine small group sessions in which the feedback, guidelines on appropriate prescribing and exchange of best practices in changing performance were discussed…… The report included evidence-based information on prescribing in targeted conditions (Wensing et al., 2009).

What sources of information were used? Still considered a "classic", the oral case presentation was by far the most frequently used source of information in 56.2% (=15,313 meetings). Other methods such as index cards, note sheets, data from electronic medical records were used significantly less frequently (20%) [Translated from German] (Siebolds et al., 2012).

Following the training meeting, CQC members collected baseline data on patients from their practices using the CQC-form to ascertain how they currently diagnosed and treated osteoporosis…. These profiles, displayed graphically with brief text summaries, permitted anonymous comparisons of individual circle members' practices (Ioannidis et al., 2007b).

Physician profiles were displayed graphically with a brief text summary. The profiles permitted anonymous comparisons of individual circle member data with their peers in their circle and with all the participating physicians in the project (Ioannidis et al., 2008).

Based on the questionnaire responses, physician profiles were generated that showed how individual physicians treated patients …. The profiles permitted anonymous comparisons of individual circle member data with their peers … and with all the participating physicians …. The physicians' profiles were than compared to the Osteoporosis Canada guidelines (Ioannidis et al., 2009).

The PPQC process includes a combination of several elements (e.g., local networking, feedback, interdisciplinary continuing education) that facilitate changes in prescribing practice GPs (Niquille et al., 2010).

The pharmacist compares individual prescribing habits with treatment recommendations (clinical guidelines) and with the most up-to-date information on the efficacy of the medication [translated from French] (Bugnon et al., 2004).

The GPs were asked to bring copies of the records for these patients to the meeting. During the meetings, the treatment of these specific patients was discussed, especially differences between what was prescribed according to the records and what was actually dispensed (Lundborg et al., 1999a).

The combination of the written simulated cases with actual prescribing allows the GPs to reflect on their decisions as well as the background for these decisions, and is in line with suggestions to make drug utilization studies closer to the reality of practice (Lundborg et al., 1999).

.. their perception of a gap between their current knowledge and skills and those needed. … Cognitive feedback is feedback on the decision process, i.e., why or how a decision is made and not on the decision itself, i.e., which decision is taken (outcome) (Lundborg et al., 1999a).

.. feedback regarding the written simulated case. ...feedback on actual decisions taken ..., the extent of use of the information factors ... and the agreement on decisions between individual members within the group (Lundborg et al., 1999a).

Feedback was given on actual decisions… and factors taken into account when these decisions were made—so-called cognitive feedback—in our case, clinical judgment analysis (CJA) (Lundborg et al., 1999b).

When looking at knowledge and attitudes, the largest improvements were indeed seen when the baseline performance was low (Veninga et al., 1999).

… overview of the recommendations given in the guidelines. The major component … was to discuss individualized feedback on the decision process underlying treatment decisions, …. Using series of 18 case vignettes, factors triggering specific treatment decisions were identified …. The case vignettes were constructed to represent real patients …. (Veninga et al., 2000).

Doctors may, during this active process, discover the consequences of new knowledge in relation to their own behaviour (Lagerlov et al., 2000).

… to introduce independent information about polymedications, …. During these meetings, public health consultants also provided feedback information about prescribing patterns and cost. Quality circles (two in each area) met every 6 weeks and some GPs were trained and given documentation (Riou et al., 2007).

The current programme was multifaceted and included expert input, voluntary feedback, peer review, and specific recommendations for changes: all features generally associated with the successful implementation of changes in general practice (Riou et al., 2007).

As GPs had previously found its provision of diagnostic and therapeutic guidelines feasible and effective, the steering group .. prepared educational material …. In addition to prescribing behaviour, costs of drugs prescribed and the use of generics in primary care, … were addressed (Spiegel et al., 2012).

They supplied statistics on all drugs prescribed by GPs under contract and the costs involved, so that the intervention provided a repeated written feedback to participants on their personal prescribing behaviour (Spiegel et al., 2012).

Most surprising was the reaction to the presence of these texts (clinical evidence) during the educational sessions. The researcher observed that GPs seized on the books with gusto when the facilitator brought them into view (Watkins et al., 2004).

Context mechanism outcome configuration 12: 'social learning'

If the facilitator uses purposeful didactic techniques (e.g., brainstorming, contentious or consensus discussions, or role play) to keep the group active and to reward exploratory behaviour during reflection on the work process (C), then the group will create a learning environment that promotes knowledge exchange (O) because learning is a cognitive process in which participants observe and imitate their peers' behaviour to gain social approval (M).

The identification of suboptimal practice is, however, only the first step for quality improvements. Several educational strategies have been used to improve doctors' clinical practice, but substantial effects are only rarely reported (Straand et al., 2006).

… found evidence that educational intervention consisting of passive dissemination of clinical practice guidelines had little or no effect on practice. This corresponds with later reports … More active strategies, like educational outreach visits and multifaceted interventions, are more effective, but require more resources (Straand et al., 2006, Gjelstad et al., 2006).

The elements of the intervention are discussions within the peer group, collection of individual prescription data, audit based on individual feedback reports, as well as a one-day regional work-shop (Gjelstad et al., 2006).

The participating GPs experienced the CME group meetings as an important arena for learning. They reported picking up good advice from others and learning practical alternatives …. GPs said their prescription data would not mirror all learning effects: 'The whole point is to reflect more, ……' (Frich et al., 2010).

Peer group academic detailing was experienced as a suitable method to learn more about pharmacotherapy, though there were participants who argued that the scheme was time-consuming (Frich et al., 2010).

The participating GPs experienced the CME group meetings as an important arena for learning. They reported picking up good advice from others and learning practical alternatives …. GPs said their prescription data would not mirror all learning effects: 'The whole point is to reflect more, ……' (Frich et al., 2010).

GPs said that the feedback on their prescription profile motivated them for reflection, learning, and change. Critical reflections on own strategies help change attitude and behaviour (Frich et al., 2010).

…. facilitated the discussion within the CME group, where each GP exposed their own prescription patterns as presented in his or her report and potentials for improvements were discussed within the group (Rognstad et al., 2013).

The systematic approach of the quality cycle was used reasonably well, although practices did have some difficulties in gathering data and evaluating progress in the improvement projects (Geboers et al., 1999).

An intensive small group education and peer review programme, which combined various strategies, was proved to influence aspects of knowledge, skills, opinions, and the presence of equipment according to the guidelines but on its own no significant influence on the provided care (Geboers et al., 2001).

It should be noted that a new skill is required for the recommended technique. It is possible that many midwives have not as yet learnt these skills. Small group CQI is not sufficient for the teaching of new techniques (Engels et al., 2003).

we found that small peer group CQI had a positive effect on changing clinical practice when no new skills had to be learnt, when the recommendations were considered to have more advantages than disadvantages, and when there was no 'ceiling effect' at baseline (Engels et al., 2003).

… of a strategy that combines a traditional feedback strategy with a multifaceted strategy, including feedback, dissemination of and group education on evidence-based guidelines, and small group quality improvement meetings in a local primary care physicians' group, using social influence as an important motivator for change (Verstappen et al., 2004b).

A multifaceted strategy combining comparative feedback on tests ordered, group education on guidelines, and small group quality improvement meetings in a local GP group, with social influence as an important motivator for change, was expected to offer good prospects (Verstappen et al., 2004c).

Compared with only disseminating comparative feedback reports to primary care physicians, the new strategy of involving peer interaction and social influence improved the physicians' test-ordering behavior. To be effective, feedback needs to be integrated in an interactive, educational environment (Verstappen et al., 2004a).

At these meetings, test-ordering behavior and changes in routines were discussed, using social influence and peer influence as important motivators for change. Social influence from respected colleagues or opinion leaders seems to have a greater effect on practice routines than do traditional medical education activities … (Verstappen et al., 2004a).

Many test-ordering problems that physicians encounter in everyday practice, such as demands for tests by patients and changing guidelines, can be discussed and may be solved in an open and respectful discussion among colleagues (Verstappen et al., 2004a).

Our intervention—which included a group education meeting with a consensus procedure and communication skills training (Welschen et al., 2004).

...various strategies for implementing the guidelines were used: lectures, role playing, skills training, peer review of performance, group consensus discussions, and problem solving of hypothetical situations involving patients. The group education and review was done in two small groups …….) and was supervised by an experienced GP (Smeele et al., 1999).

An intensive small group education and peer review programme, which combined various strategies, was proved to influence aspects of knowledge, skills, opinions, and the presence of equipment according to the guidelines (Smeele et al., 1999).

Either the facilitator or the expert is asked to recommend one or two relevant articles to follow up the discussion. The expert has frequently selected an article in advance, from knowledge of frequently asked questions in prior learning environments (Peloso and Stakiw, 2000).

The group selects topics, directs the agenda, points out inappropriate comments or inappropriate practices in a constructive manner, and also leads group members back on topic. The conversation is free-flowing and highly interactive (Peloso and Stakiw, 2000).

The group encourages other points of view to establish practice norms. This allows individual GPs to see where they may deviate from usual standards of care (Peloso and Stakiw, 2000).

What have you gained from participating in this practice-based small group learning project – learning from colleagues: the group discussion allowed us to share our experience and management of various problems (MacVicar et al., 2006)?

Group discussion allows for sharing of experiences and of thoughts about strategies for implementing practice changes and about overcoming anticipated barriers (Armson et al., 2007).

Learning from and with colleagues is an important source of both new information and strategies for applying that information to practice (Armson et al., 2007).

Most GPs and PNs valued learning together. Several GPs from Group 1 said that they were consistently satisfied with the learning that took place in their group (Overton et al., 2009b).

I think there is a mutual keenness to learn from each other (Overton et al., 2009b).

A ‘‘mutual keenness’’ to learn from and about each other emerges as a crucial ingredient for learners to feel that their learning needs were being met given the multi-professional context (Overton et al., 2009b).

'Learning from colleagues' (three comments) 'Has been very constructive and helpful (Rial and Scallan, 2013).

….to work through cases together and massively furthered my learning.' 'Really useful (secondly) discussion with colleagues/peers regarding management of conditions in real practice (Rial and Scallan, 2013).

This should not be done schematically according to a fixed schedule, but rather with the help of various methods that reflect the reality of everyday practice (e.g. case discussions, file card analysis, documentation with a study character, video, etc.). They can also be used in parallel [translated from German] (Szecsenyi et al., 1994).

At the same time, our concept leaves room for case-related and problem-oriented learning using our own patient examples from practice [translated from German] (Tausch et al., 1995).

They (the modules) are didactically structured in a way that allows comparison of theoretical approaches with the actual procedure in practice and so the principle of cooperative learning can be realised [translated from German] (Tausch and Harter, 1996).

The principle of cooperative learning in the quality circle (everyone learns from everyone else) leads to increased flexibility and more pleasure in practice [translated from German] (Tausch and Harter, 1996).

Almost 73 % of the participants thus confirm that the intercollegial exchange in the Pharmacotherapy Quality Circle - as in all other quality circles (10-12) - can be regarded as one of the fundamental mechanisms of action [translated from German] (Andres, 2004a).

They particularly appreciate the opportunity to compare their own prescribing behaviour with that of their colleagues and to discuss it in the familiar setting of a small group. In addition to this intrinsic principle of quality circles of intercollegial, equal and non-hierarchical exchange in a familiar group (of so-called "peers"), the feedback of one's own prescription data with the possibility of comparing oneself with other colleagues and to measuring one's own progress in the context of a before-and-after comparison (evaluation) contributes significantly to the success of the project [translated from German] (Andres, 2004a).

Especially the expectation of a successful collegial exchange of experiences, which was most frequently mentioned at the beginning of the project, seems to have been fulfilled: The vast majority of participants emphasised that they had received helpful tips from colleagues who had helped them to implement changes [translated from German] (Andres, 2004b).

Regular ... reflection on common practice with other colleagues. ... individual feedback, ... discussed in the group under the guidance of a moderator ... benchmark activities… The core element of these circles is the conjoint discussion of evidence-… and management of patients on the basis of prescribing data…. (Schneider et al., 2007).

... impact of physicians' views on the use of performance feedback, indicators and price comparisons. This set of views reflects both a willingness to reflect critically on one's professional performance and a positive attitude regarding the ideal of evidence-based medicine (Wensing et al., 2009).

... an important component of the improvement strategy is an individual learning activity: reading and reflecting on the written feedback reports. This is consistent with insights from educational research, which showed that .... learning activity is an important predictor of the effectiveness of any educational programme for professionals (Wensing et al., 2009).

It involved practice audits, feedback on performance by peers ..., interactive discussion of evidence, small-group educational workshops led by ... facilitators and supported by local osteoporosis specialists, diagnosis and treatment reminders (CQC-forms), and making personal plans for improving clinical management of osteoporosis in accordance with the OC 2002 guidelines (Ioannidis et al., 2007b).

The educational intervention consisted of eight key components: 1) audit and feedback, ...; 2) interactive small group discussions ...; 3) use of opinion leaders ...; 4) reminders, ...; 5) multi-professional collaboration and community building ... (Ioannidis et al., 2008).

Our educational intervention consisted of eight key components and consisted of 1) audit and feedback, 2) interactive small group discussions 3) use of opinion leaders, 4) remainders, 5) multiprofessional collaboration with osteoporosis specialists, 6) nominal financial reimbursement to circle members, 7) patient medicated interventions 8) and educational material (Ioannidis et al., 2009).

The key elements are local networking; feedback of comparative and detailed data regarding costs, drug choice, and volume of medical prescriptions; as well as interdisciplinary continuing education adapted to primary care needs (Niquille et al., 2010).

(GPs)... depend less on factual knowledge than on their capacity to reflect in action, to be in control of ... learning process, to be motivated, and to perceive meaningfulness; ... it is beneficial ... when the social climate is supportive … (Lundborg et al., 1999a).

The intervention comprised several elements, … the provision of individual feedback on the series of simulated cases … and on actual prescribing, use of outreach visits, use of peer group discussions, and use of existing guidelines. …, the sessions were especially tailored for each group (Lundborg et al., 1999a).

Cognitive feedback is feedback on the decision process, i.e., why or how a decision is made and not on the decision itself, i.e., which decision is taken (outcome) (Lundborg et al., 1999).

The combination of the written simulated cases with actual prescribing allows the GPs to reflect on their decisions as well as the background for these decisions, and is in line with suggestions to make drug utilization studies closer to the reality of practice (Lundborg et al., 1999a).

For UTI the usually high use of the non-recommended drugs was stressed and was related to the ... high use in the simulated cases and the cues that triggered these decisions… the identity of the individual doctor was disclosed at the request of the participating GPs (Lundborg et al., 1999a).

Learning methods that have proven effective include interactive and problem-solving exercises combined with feedback on performance. Combined strategies that deal with different types of barriers seem to be more effective than single separate strategies (Veninga et al., 1999).

Once the problem is acknowledged, one must learn and understand what caused the problem and how it can be solved. For this, elucidating and discussing the decision process underlying treatment decisions may be useful. To accept new information or practice recommendations the credibility of the source is of importance (Veninga et al., 2000).

Problem based learning, …, places the emphasis on the learner's own initiative to discover problems and how to improve. By discussion in peer review groups the individual doctor's self-efficacy, defined as one's ability to organise and execute a course of action required to produce given results, is substantially increased (Lagerlov et al., 2000).

Although academic knowledge is important, the fundament for professional development is reflection of one's own practice or, as Schön stated, ''reflection-in-action''. Until now, these aspects of learning have been mostly neglected, … (Eliasson and Mattsson, 1999).

The strengths of small CME groups are principally that learning is self-directed and based on relevant problems and ''reflection-on-action'', a pedagogic prerequisite for effective learning (Eliasson and Mattsson, 1999).

…, hardly any participants failed to contribute to the group discussions. … they thought that for a meaningful comparison of prescription costs such data must be correlated with morbidity and disorder distribution among patients. Every opportunity was taken to discuss various clinical aspects of patient management and pharmacotherapy (Spiegel et al., 2012).

…, CME should involve the learner actively and as we know from the protocols that there were hardly any participants who did not contribute to the discussions, we can say that our qualitative data support the general notion that quality circles are an appropriate CME format for practising physicians (Spiegel et al., 2012).

A defensive attitude of the GP, for instance, been linked to overprescribing, Quality improvement requires a reflective attitude of one's own knowledge and performance (van Driel et al., 2007).

There is, however, adequate evidence that merely distributing a guideline without any additional intervention does not have an effect on prescribing behaviour (van Driel et al., 2007).

Participants and facilitators saw the strength of the small groups as facilitating the learning of practical skills (e.g. through the use of role play (de Villiers et al., 2003).

Discussion is based on evidence-based topic notes prepared for each leader as well as individual prescribing and laboratory data related to the topic that is provided to each GP. Although the education groups cover all aspects of clinical practice… (Richards et al., 2003).

Context mechanism outcome configuration 13: 'interdependence between health insurance companies and GPs'

If physician network organisations require continuous QC activities (C), then QCs will negotiate priorities and design creative solutions (O) because the tension between autonomy and obligation spurs the group to act and negotiate together to reach a common goal (M).

The physicians in the Rhine-Main network of physicians committed themselves to participating in QCs when they joined the contract. In QCs, they discuss prescription patterns for specific clinical situations and adapt (guidelines) to local conditions [translated from German] (Papendick et al., 2006).

The participation of German GPs in QCs is mandatory in order to be part of government-funded disease management programmes (DMPs) or to be part of pilot projects with health insurance funds (Vollmar et al., 2010).

The principle of 'quality circles' is now also used for clearly defined quality promotion purposes: The Associations of Statutory Health Insurance Physicians (KVs) of Hesse, Saxony-Anhalt and Lower Saxony started off with structured QC programmes to demand rational pharmacotherapy. In the meantime, QCs have become a requirement in numerous contracts (for disease management, family doctor-centred care, etc.) [translated from German] (Andres et al., 2010).

The QCPs were designed as a measure of quality assurance in pharmacotherapy and, as doctors were expected to encounter various problems in educating their patients in the use of generics, to offer them a forum for discussing these with their peers (Spiegel et al., 2012).

…. Specifically, we suggest that centrally organized experts make the strategic decisions about best practices based on evidence but local site staff members make tactical decisions about how best to implement the plan based on what fits local circumstances, needs, and cultures (Parker et al., 2007).

… interrelationships that exist among a particular organization's technologies, tasks, goals, stakeholder characteristics, and environment …. Participation provides one of the best methods for obtaining valuable information about .. local conditions (Parker et al., 2007)

Context mechanism outcome configuration 14: 'threat to professional autonomy'

If GPs feel that the QC programme is only a top-down managerial intervention to reduce costs (C), then they will not be motivated and will not participate (O) because they feel unsafe and think they lack autonomy in their clinical role (M).

In general, efforts are being made to improve practice performance by developing guidelines. Guidelines are intended to help general practitioners to tailor the care of individual patients to generally accepted scientific findings. However, guidelines are not sufficiently implemented. The reason for this is probably the lack of practicability and low relevance of the guidelines for family doctors. In addition, they give general practitioners too little room for their own medical decisions [translated from German] (Mols et al., 2005).

… much pressure about their prescribing budgets that they participated … as an attempt to appease their prescribing adviser. This resulted in poor attendance and a reluctance to participate …. This defeated the notion of reaching and establishing a consensus that was 'owned' by the practice as a whole (Watkins et al., 2004).

…., it emerged that it could be difficult for GPs to match top-down initiatives with everyday practice. The difficulty, which is another form of pressure, was expressed well by one GP who explained in the interview (Watkins et al., 2004).

The structure of each session demanded a firm commitment … to a common management strategy for …, we found that GPs were reluctant to do this. This reluctance appeared to arise from a sense of threat to their perceived need for clinical autonomy —… (Watkins et al., 2004).

The concept of clinical autonomy is highly valued and it has been argued that in British general practice, prescribing is the principal battleground on which the cause of clinical autonomy is being defended (Watkins et al., 2004).

An understanding of what GPs mean by clinical autonomy and how it affects their ability to reach explicit consensus on clinical management decisions is crucial if practice prescribing is to become more cost-effective. Many GPs perceive guidance on cost-effectiveness … as an intrusion on their professional independence (Watkins et al., 2004).

… GPs and facilitators pointed to the difficulty of reaching consensus on a best buy, ……. Some found the term 'off-putting' because of its financial connotations. This suggests that some GPs may feel that their management decisions should be based on wider considerations than those of cost-effectiveness (Watkins et al., 2004).

GPs were also unlikely to take part if they felt that the sessions would make them feel unsafe or if they felt that the sessions were yet another 'top-down' managerial intervention, where the main intention was to reduce prescribing costs (Watkins et al., 2004).

The majority of respondents in both regions expected to benefit from participation in QCs, but they were unwilling to accept the risk that QI could be misused for control or cost reduction [translated from German] (Beyer et al., 1999).

In the discussion with facilitators, the QC participants' claim to be able to work in a self-determined and independent manner became apparent. For this reason, the National Association of Statutory Health Insurance Physicians (KBV) and the Associations of Statutory Health Insurance Physicians (KVs) have laid down the thematic and methodological autonomy of the circles as indispensable in their guidelines for quality circle work and have committed themselves to supporting them [translated from German] (Siebolds et al., 2012).

Physicians have raised similar concerns about threats to the autonomy of their profession ... It is within this context, a time of declining perceived autonomy for individual physicians, that we compare the participatory local and central expert approaches to QI (Parker et al., 2007).

Context mechanism outcome configuration 15: 'interdependence among group members'

If participants maintain a learning environment based on trust that promotes knowledge exchange, assisted by facilitators who use professional techniques (e.g., contentious discussion, reaching consensus, and role play), (C), then participants will adapt and generate new knowledge for local use (O) because they see themselves as similar, and so act and negotiate cooperatively to achieve a common goal (M).

… that combining information from a peer detailer with reflection on one's own need for change together with trusted colleagues would improve prescribing patterns (Gjelstad et al., 2013).

Balancing interests and concerns is an essential aspect of GPs' work (Frich et al., 2010).

The physicians discussed their feedback data, and if it appeared that a physician clearly ordered fewer tests than his/her colleagues, he/she made plans for ordering more tests (Verstappen et al., 2004b).

interactive group education in which national guidelines were related to the individual physician's actual test-ordering behavior and an effort to reach a group consensus on the optimal test-ordering behaviour (Verstappen et al., 2004a).

The personal interaction and mutual influence between colleagues implicitly resulted in an individual or group contract (Verstappen et al., 2004a).

Psychological research into group behaviour has produced an inventory of factors that influence conformity with group standards. Unanimity provides more pressure to conform, while privacy makes it easier not to (van Eijk et al., 2001).

In presenting the evidence we used relative and absolute effects of antibiotics by means of the numbers needed to treat and the numbers needed to treat to harm. This discussion resulted in group consensus about indication and first choice antibiotics per disease (Welschen et al., 2004).

…a learner-directed agenda of topics, presentation of information by trusted peers or local experts, and opportunity for practice and feedback. If the information comes from several sources—…—the perception of need for and the durability of change are enhanced (Peloso and Stakiw, 2000).

Interactive approaches, however, can be effective, particularly when they involve participation in small peer groups that foster trust, promote discussion of evidence relevant to real cases, provide feedback on performance, and offer opportunities for practising newly learned skills (Armson et al., 2007).

It is known that small groups can encourage active participation and deep learning as well as learning of group skills and the ability to express new ideas (Kelly et al., 2007).

The acquisition of new knowledge, skills, and approaches to bridge this gap follows. Often, however, access to new information alone is not sufficient. Reflection and discussion are necessary to help physicians 1) identify areas where current practice requires change and 2) develop strategies to integrate this new approach (Armson et al., 2007).

There was widespread agreement that the principal requisites for a good facilitator were experience and competence in small-group skills. One facilitator identified another skill: 'You've got to be able to hold the tension between comforting and challenging (Kelly et al., 2007).

The decentralised approach at the local, internal level consists of collecting available knowledge from the everyday practice of the medical participants and formulating a workable consensus from this. The advantage of this method is that the physicians are actively involved in this process and are more motivated to implement the developed guidelines. In addition, this results in a stronger commitment and acceptance by the participants [translated from German] (Tausch and Harter, 1996).

The programme for the meetings was based on principles of quality improvement, which implied that a systematic procedure was followed: themes were selected, objectives were formulated, plans for improvement were made and implemented and changes were evaluated (Wensing et al., 2004).

In more than 90% of the meetings, new health care aspects could be identified according to the facilitators' assessment [translated from German] (Andres et al., 2010).

Facilitators ensure that participants not only focused on a specific topic, but also focus on their own actions in their own practices and that they identify blind spots in their daily work. Approximately 90% of the methods used are certified as having been able to reveal previously unknown aspects of care [translated from German] (Andres et al., 2010).

Discussions concerning the progress made by incorporating strategies identified in the prior phases of the project were shared among the group. Based on the major findings from the profiles, members discussed additional measures that should be implemented in their practices to increase alignment with the 2002 guidelines (Ioannidis et al., 2008).

An analysis of prescription attitudes in comparison with scientific and economic data and the search for alternatives in the drug market is then run by each PPQC to build its own consensus. An annual assessment is conducted for facilitating the continuing improvement of the process (Niquille et al., 2010).

.. over time those GPs who, at first, were reluctant to prescribe generics changed their attitude, …. After 2 years of QCP participation ..., GPs confirmed that the prescribing of generics, where appropriate, had for them become common practice and that their efforts and the various discussions… had helped (Spiegel et al., 2012).

The reluctance of GPs to appear in agreement with one another does not mean that discussions are pointless or ineffective. For example, as we found in an earlier study, the process of sharing different management strategies for a particular clinical problem may result in marked changes in prescribing behaviour (Watkins et al., 2004).

Context mechanism outcome configuration 16: 'identifying and removing barriers to change'

If participants, supported by skilled facilitators, address barriers to change (C), then they are more likely to implement the innovation (O) because participants help each other develop strategies to identify and overcome these barriers (M).

Therefore, it is recommended to address potential barriers to change when tailoring an intervention targeting change in medical performance (Straand et al., 2006, Gjelstad et al., 2006).

it appears to be essential that throughout the implementation personal obstacles are addressed (Geboers et al., 2001).

The implementation of new knowledge is facilitated by expressing and discussing how to overcome obstacles to its acceptance (van Eijk et al., 2001).

The barrier most often mentioned for changing the CHF treatment was related to perceived difficulties with changing treatment initiated by a specialist (Welschen et al., 2004).

Cranney also identified some barriers to translating evidence into practice including: doubts about the applicability of data to particular patients, against attitudes and the absence of an educational mentor (Kelly et al., 2007). [Trustworthy data]

.. study feedback to individual doctors ... ... The recommendations needed to be reformulated to enable a quality assessment of patient treatment to be judged from prescription feedback. Such quality criteria were developed during group discussions between doctors participating in the study (Lagerlov et al., 2000). [Trustworthy data]

Within the group, members endeavour to identify specific barriers to these practice changes and to formulate implementation strategies to facilitate desired changes (Armson et al., 2007).

The acquisition of new knowledge, skills, and approaches to bridge this gap follows. Often, however, access to new information alone is not sufficient. Reflection and discussion are necessary to help physicians 1) identify areas where current practice requires change and 2) develop strategies to integrate this new approach (Armson et al., 2007).

Commonality and differences between local practices. Some participants commented that listening to ''how peers work'' was a benefit: Finding out what everybody is doing locally . . . it makes you think 'would that be better?'(Overton et al., 2009b).

... an educational workshop, and facilitators led small group discussions that identify barriers to the management of osteoporosis and strategies to improve patient care, family physicians demonstrated greater odds of administering osteoporosis therapy appropriately over a two-year period (Ioannidis et al., 2009).

Back at the practice, the difficulty is to apply the consensus reached in the group, while considering the particular situation of each patient (Bugnon et al., 2004).

Barriers within doctors relate to competence, motivation and attitudes, and personal characteristics such as learning style, whereas barriers within practices exist as doctors do not work entirely independently (Veninga et al., 1999).

These results make clear that, although in the educational program a lot of attention was paid to overcome barriers within GPs, barriers within practice setting may not have been sufficiently addressed, preventing the correct implementation of the recommendations concerning asthma maintenance treatment in practice (Veninga et al., 2000).

Once a doctor has accepted a new practice and has the intention to change, there still may be several barriers within the practice setting that prevent the actual implementation in practice. Discussing problems encountered in everyday practice may help to overcome such barriers to implementation (Veninga et al., 2000).

Context mechanism outcome configuration 17: 'need for competence, autonomy and relatedness'

If participants create new knowledge and plan an implementation strategy (C), then they feel satisfaction, responsibility and stewardship (O) because this fulfils their need for competence (being able to achieve specific objectives) (M), autonomy (a feeling of being in control of their own behaviour) (M), and relatedness (a sense of connection to a larger group) (M).

The decentralised approach at a local, internal level includes participants gathering experience from daily practice and formulating a feasible consensus solution. The advantage of this method is that GPs are actively involved in this process and therefore motivated to implement the (newly) developed guidelines. In addition, participants involved will be more likely to accept (new knowledge) and feel committed to implement it [translated from German] (Tausch and Harter, 1996).

Potential advantages of the local approach: it promotes buy-in, maximizes fit to local culture and circumstances, maximizes the ability to work out the details associated with implementation, and produces a highly rewarding experience (Parker et al., 2007).

… new knowledge is … facilitated through the "... working with it, discussing it, and connecting it with what is … known…. because physicians … generate … 1 question for every 2 patients … the opportunity to explore these questions in …groups can stimulate … ideas for future change (Armson et al., 2007).

… working on projects… is … of great advantage. Everyone is involved ...has to prepare something for the next meeting. The structure of the quality cycle committed us to make all steps …. You don't cling to ideas but …come to changes. Evaluation … is … important …. (Geboers et al., 2001).

A higher appreciation of the quality of the group discussion led to more effect of the intervention on the treatment of asthma exacerbations and on the duration of treatment prescribed for uncomplicated urinary tract infections (Veninga et al., 2000).

The quality of the group discussion as evaluated by the participants seems to be an important predictor of successful educational group meetings (Veninga et al., 2000).

When studying how physicians learn and change their medical practice, disposing, enabling, and forcing factors can be identified. These are a mix of professional factors, such as the desire for competence, social factors such as working climate, and personal factors such as curiosity (Lundborg et al., 1999a).

International and national guidelines are more difficult to implement than local or internally developed guidelines (Veninga et al., 1999).

Only in The Netherlands, national guidelines were developed by GPs and intended primarily for their use. This guideline initiative has been quite successful and highly accepted, because it is initiated and "owned" by the GPs themselves (Veninga et al., 1999).

… In addition to the pragmatic benefits of the local approach, participants also mentioned one psychological advantage: intrinsic reward. …the local approach might be rewarding because it promotes team camaraderie…. "It [the local approach] is more creative and it's fun ... I enjoyed it." (Parker et al., 2007).

Not surprisingly, they personally relished the level of participation that the local approach affords. It is possible that … high level of enthusiasm permeated the entire team. In fact, every person on this team reported enjoying the opportunity to participate at a high level on this project (Parker et al., 2007).

…potential advantages of the local approach: it promotes buy-in, maximizes fit to local culture and circumstances, maximizes the ability to work out the details associated with implementation, and produces a highly rewarding experience (Parker et al., 2007).

Whereas the effectiveness of many PBLI methods is unknown, social interaction, a key element in some PBLI approaches, appears to increase physician satisfaction with learning and improve certain practice and patient outcomes (Summerton, 2004).

Context mechanism outcome configuration 18: 'intention to change'

If participants publicly announce their intention to change (C), then they are more likely to implement the change (O) because they and others in the group both think it is a good idea and believe they can carry it through (M).

It is crucial to the model that practice teams formulate goals for improvement and attempt to achieve these goals in small scale (Geboers et al., 1999).

The third was the development of individual and group plans for change, to stimulate GPs to really put their plans into daily practice (Verstappen et al., 2004c).

An example of such an individual commitment was, 'I will order fewer haemoglobin tests, because I realise that this test does not give much information in patients with vague complaints' (Verstappen et al., 2004c).

Plans at group level were also made, e.g. the plan to use the …brochure to inform patients …, or … to follow the national guideline on delaying testing in patients with vague complaints. All results show that the quality circles were an essential element in the improvement strategy (Verstappen et al., 2004c).

The strategy gives physicians an opportunity to discuss their test-ordering performance with colleagues on the basis of actual performance data, making the participants feel more committed to the agreements (Verstappen et al., 2004a).

Groups can be more effective in accomplishing tasks… and publicly announcing behavioural changes results in more commitment than privately announced change (van Eijk et al., 2001).

In most groups, there had been a discussion of the optimal treatment, as well as of barriers to change treatment in line with the recommendations of the guidelines. The idea was that by sharing experiences and learning from peers, possible solutions to perceived barriers might be offered (Welschen et al., 2004).

…a structured tool for promoting reflection on the topic discussed at the group meeting and for identifying plans for practice change. The commitment to change section of the log sheet appears (Armson et al., 2007).

… participants stated that they had applied some learning to their practice. They reported a general increase in awareness of conditions and also confidence in treating them (Kelly et al., 2007).

I was surprised to see how willing people were to reflect on their own behaviour and practice... and constantly make comments like: "Well, did I really do that? I surely have to pull myself together". Very strong will, apparently, to make changes (Frich et al., 2010).

The third was the development of individual and group plans for change, to stimulate GPs to really put their plans into daily practice (Verstappen et al., 2004b).

Groups can be more effective in accomplishing tasks, and publicly announcing behavioural changes results in more commitment than private change (van Eijk et al., 2001).

…. draws on 'the theory of planned behaviour' and other studies that have identified the pre-requisites of successful behaviour change in general practice reviewed by Veninga et al.2000 (Watkins et al., 2004).

Discussions in the QCs are often lively and then lead to the determination of a consensus that everyone is committed to implementing in the best possible way [translated from French] (Bugnon et al., 2004).

The discussions within PPQCs are often lively and end in the determination of a common consensus that everyone makes a commitment to apply to the best of his or her ability (Niquille et al., 2010).

Theories of adult learning stress the importance of motivation; the doctors must see the need and be willing to change their behavior to increase their professional competence (Veninga et al., 1999).

Context mechanism outcome configuration 19: 'testing new knowledge'

If participants validate and test new knowledge in a QC, moderated by a skilled facilitator in a safe environment (C), then they feel confident putting that knowledge to use in everyday practice (O) because they have had the opportunity to practise and familiarise themselves with the innovation (M).

Interactive approaches, however, can be effective, particularly when they involve participation in small peer groups that foster trust, promote discussion of evidence relevant to real cases, provide feedback on performance, and offer opportunities for practising newly learned skills (Armson et al., 2007).

Understanding application of new knowledge. The discussions helped members to consider translating evidence into practice: Sometimes you can read about things but are unable to see how to put it into practice and I feel PBSGL enables you to think how you can do that (Overton et al., 2009).

Innovative solutions to clinical problems can be shared, and nonstandard methods are highlighted in a nonthreatening way (Peloso and Stakiw, 2000).

…, in some situations, evidence may not exist or local experts may disagree with the evidence. The facilitator can help by reinforcing the tenets of evidence-based medicine, by selecting methodologically sound overviews …, and by asking the expert to address any evidence that exists for the recommendations made (Peloso and Stakiw, 2000).

This means, for example, that the group is currently working on a new topic, while, analogous to steps d and e, checks are made whether changes have taken place in the doctor's actions (or in the actions of the entire practice team) with regard to the previous topic [translated from German] (Szecsenyi et al., 1994).

Next, they examined empirical evidence concerning the validity of these solutions. To facilitate this process, teams had access to the large resource library that the research team had assembled (Parker et al., 2007).

Context mechanism outcome configuration 20: 'gaining confidence in an innovation'

If the group repeatedly practices implementing and adjusting to an innovation (C), then they trust their own competence and turn the innovation into a habit (O) because successful outcomes increase their confidence in their abilities (M).

A cyclic process … is used which leads project teams through the improvement projects. This means that after having chosen a subject that requires attention, the team sets specific targets for the project, analyses the actual performance on the subject, makes and introduces plans for change, and evaluates progress (Geboers et al., 1999).

One meeting may not be enough to actually change treatment, although that is the usual procedure in the peer review groups. Behavioural theories stress the importance of repetition, especially for changing routine behaviour (Welschen et al., 2004).

Six months after the intervention, general practitioners again received feedback on their prescribing behaviour, based on insurance claims data comparing the period after the intervention (March to May 2001) with the same period before the intervention (March to May 2000) (Welschen et al., 2004).

In general, GPs were excited to find in the second year that they had indeed changed in accordance with their plans, and they were then usually more motivated to implement further changes (Verstappen et al., 2004b).

The intervention comprised repeated feedback on prescribing routines and an intensive programme of educational small group sessions, as described by Bahrs et al. (2001) (Wensing et al., 2004).

Suitable data illustrate everyday practice. Participants formulate and discuss possibilities for improvements within the collegial framework of the quality circle and implement these in a further step in their own practice. Renewed data collection then allows them to observe effects of the implemented measures and gain confidence. The results are input for a new discussion in the quality circle [translated from German] (Andres, 2004b).

The analysis that is carried out each year secures change, as they give the pharmacist the means to maintain motivation: each doctor receives detailed feedback on their successes and the progress still to be made in relation to a control group (doctors working without particular collaboration with pharmacists) and in relation to the good results of other colleagues [translated from French] (Bugnon et al., 2004).

The constant feedback on progress achieved and the further possible improvements are other success factors (Niquille et al., 2010).

The evaluations of the GPs' prescriptions are performed every year to provide concrete feedback and a source of motivation … to change prescription attitudes (Niquille et al., 2010).

Doctors who were accustomed to discussing their prescribing in peer groups changed their behavior more as a result of such (iterating) peer group meetings than doctors who are not used to this approach (Veninga et al., 1999).

In contrast to our pragmatic study, the interventions in most trials consist of multiple sessions on the same topic supervised by a researcher or an expert, a situation usually very different from real life (van Driel et al., 2007).

These results demonstrate the need to look at repeating/reinforcing messages at 12–24-month intervals (Richards et al., 2003).

Context mechanism outcome configuration 21: 'repetition priming and automaticity'

If participants build a steady group and practice using QI tools (C), then they will successfully implement new knowledge into everyday practice (O) because responses improve with repetition: 'practice makes perfect' (M).

Favours change: Having regular practice meetings on quality improvement with all staff (Geboers et al., 1999, Geboers et al., 2001).

Successful projects might not only positively reinforce the introduction of CQI, but could also bring about a positive attitude to the other aspects of systematic and continuous quality improvement (Geboers et al., 2001).

Regular meetings with the practice team was selected as a topic for improvement by several of the practices (Engels et al., 2006).

Finally, for the same reason we were unable to assess possible learning effects, which could mean that quality activities may become less time-consuming over time, even if the approach is directed to other clinical problems (Verstappen et al., 2004b).

This schedule was repeated a year later, using the same three clinical problems, to assess whether a GP or GP group had implemented the plans for change and to initiate further improvements. This iterative aspect was another important feature of the strategy (Verstappen et al., 2004c).

In general, GPs were excited to find in the second year that they had indeed changed in accordance with their plans, and they were then usually more motivated to implement further changes (Verstappen et al., 2004c).

Our strategy also seems worthwhile because small-group quality improvement meetings can help build a local practice group focusing on quality improvement (Verstappen et al., 2004a).

However, other studies have shown that repeated interventions are needed for sustained behavioural changes (van Eijk et al., 2001).

…one meeting may not be enough to actually change treatment, although that is the usual procedure in the peer review groups. Behavioural theories stress the importance of repetition, especially for changing routine behaviour (Welschen et al., 2004).

The benefit from participation depended significantly on the frequency of the meetings. Real improvements to performance in daily care can only occur if there is an ongoing and regular quality circle process (Aubke et al., 2003).

The benefit from participation depended significantly on the frequency of the meetings. Successful projects might not only positively reinforce the introduction of continuous QI, but could also bring about a positive attitude to the other aspects of systematic and continuous quality improvement (Geboers et al., 2001).

The intervention comprised repeated feedback on prescribing routines and an intensive programme of educational small group sessions, as described by Bahrs et al. (2001) (Wensing et al., 2004).

Assuming a straightforward dose–response relationship, it was expected that the groups were most effective when physicians participated in most sessions. Stronger effects were also expected, if the groups comprised of physicians who had more experience with learning in small peer groups … (Wensing et al., 2009).

The quality circles (N=1,241) documented an average of 22 meetings (mean value: 21.96) (range: by definition min. 4, max. 127 meetings [translated from German] (Andres et al., 2010).

The higher the attendance rate and the more experienced the GPs in a group were, the shorter the courses were prescribed for UTI after the intervention (Veninga et al., 2000).

In principle, material learnt in brief training workshops decays quickly over time, whereas repetition on many occasions ensures greater retention (Murrihy et al., 2009).

Practitioners develop expertise when they move from their comfort zones to examine problems "at the upper limit of the complexity they can handle;" they learn, and iteratively gain mastery through cycles of reflecting on practice, obtaining feedback, and adjusting performance (Sommers et al., 2007).

Appendix 8.3: Quotes of interviews in Phase III

Sources:

(1) S.S. GP and manager, CEO of Santémed network of primary health care centres owned by health insurance company
(2) O.R., GP, tutor in MediX Bern, a doctor-owned network of primary health care centres in Bern
(3) M.J., GP and manager, facilitator and member of Sanacare's management board, a network of primary health care centres owned by health insurance companies
(4) V.M (4a). + E.K. (4b), social scientists, representatives of the professional body Swiss Association of Medicine
(5) O.S., GP, facilitator of a QC belonging to MediS Zürich, a doctor-owned network of primary health care centres, Professor at the Institute of General Practice in Zürich
(6) S.K., GP, executive for General Practice at the hospital in Aarau

Preconditions

Context mechanism outcome configuration 1: **'participants know what to expect'**

If the introductory workshop conveys the principles of QI in PHC and the workings of QCs

(social persuasion) (C), this will increase future participants' motivation to join QCs (O) because

they learn what to expect and may feel that they are capable of meeting expectations (increase of self-efficacy) (M).

Well, if it's set up that way, I'm sure it'll work. [translated from Swiss German] (3).

So, I think that everything should be well organised and planned, and that you really have to understand what it's all about – as far as you can understand it without having gone through the process at least once [translated from Swiss German] (2).

Context mechanism outcome configuration 2: **'need for autonomy'**

If the administration at the national level or at the level of health insurance companies entrusts GPs with QI and autonomy (puts them in control of how do it) (C), then GPs may consider participating in QCs (O) because they feel they can take on the responsibility and make a difference (M).

You actually buy your network participation or membership through QC attendance. This is sort of obstructive because it results in a kind of obligation for the participants. But the opportunities that such a network offers with different QCs reduces the problem because you have different choices. You find people who you may want to work with in your area. This kind of organisation may fit your needs [translated from Swiss German] (5).

Yes, of course, these are specific drivers to meet, and after all it being member of a physician network is like a commitment to participate in QC…at the same as you may fear limitation in your professional autonomy etc… but there are rules and if everybody sticks to these rules will work [translated from Swiss German] (3).

The physician networks are very open as to QCs. They do not set any rules on what is done or dealt with in the QCs, there is simply a requirement that participants must conduct QCs [translated from Swiss German] (2).

In order to account for the interviews data, I developed an additional context mechanism outcome configuration at the organisational level: '**feeling of having a say'**

If an organisation, (e.g., a physician network organisation) has a decentralised policy that encourages use of local knowledge (C), then the QC takes on tasks (O) because they feel that they have a say in QI in their practice (M).

I was asking myself what autonomy is and what it actually means...so decentralised organisation means accepting local decisions and having a flexible administration. So not simply stubborn and rigid, but adaptable to local decisions, which are then taken by the QC, for example [translated from Swiss German] (2).

So, if I want to promote and do QCs, then it's in the nature of the QC that different groups come up with different solutions. And you have to be able to live with them and you also have to be able to endorse them as an organisation, otherwise the QC instrument wouldn't make sense [translated from Swiss German] (1).

For this reason, it is certainly beneficial if QCs are as decentralized as possible and adapted to local conditions; but I also think that depending on the network and organisation, certain formal requirements must be in place. And if someone joins this network, then they also accept the conditions to a certain extent [translated from Swiss German] (5).

If you recognize positive things that you can perhaps implement well within a short time, or sometimes slowly, then of course you have to; if you don't do that, you nip further initiatives in the bud, because then no further good suggestions will come if nothing is ever implemented. People lose motivation [translated from Swiss German] (3).

I think that if something like this is developed by a QC now, then there should also be appreciation from the organisation. [translated from Swiss German] (3).

If we want to discuss something and talk about it, about a vitamin or whatever, it doesn't matter, then the organisation should support it. It should be interested that we get prescription data to objectify our behaviour and also to show any progress that may result from the whole discussion. Or whatever, but I believe that the organisation should make this possible; that is important [translated from Swiss German] (3).

As I have described before, I believe we should have certain freedom to implement new things in an organisation. At the same time, it should be clear what is important to the organisation. Organisations should also provide knowledge and create a kind of platform for knowledge exchange [translated from Swiss German] (3).

Establishing the group

Context mechanism outcome configuration 3: **'sharing similar needs'**

If the administration at the organisational level of QCs provides administrative support (i.e. training of facilitators, data gathering and provision of evidence-based information), protected time and space, CME points, and small financial incentives to QC participants (C), then they will meet to exchange ideas (O) because QCs are GPs' preferred learning style (M), support generates positive expectations among participants (M), and GPs think QC meetings with their peers will be useful (M).

Yes, such a network allows high organisational and professional autonomy...and this is a good start for QCs [translated from Swiss German] (2).

For me this (protected time) is more than just the aspect of time, it relates to the amount of the work before and after the meeting....and not just that no telephone rings. I think you should not be disturbed...and you have to plan that [translated from Swiss German] (3).

It benefits the participants a lot, that's no question. I just ask myself how do we manage to take away 1½ to 2 hours from the working day without increasing the amount of the work? Basically, this is probably an organizational problem. In an ideal world, we should have time to discuss things with each other and form a basis for identification, GP-based, mutual trust, a discussion of sensitive issues, and trying something new together [translated from Swiss German] (3).

The time in the QC, that is the time during which no phone calls should come in, and it should also have no influence on the amount of the work that day. It is a little easier with the internal staff, by that I mean the participants from here. Those with a longer journey have more difficulties [translated from Swiss German] (2).

I believe that 1½ hours should be enough for a QC according to our experience. It is extremely important that you are not disturbed. And the amount of work on the same day must not increase because of the QC. After all, this is an integral part of the work and also of the contract with the network [translated from Swiss German] (4b).

If I do it this way, it's probably easier later. For example, I have to know how much money is available from the network; this is important if the implementation of the ideas also involves costs [translated from Swiss German] (4a).

So really a fee to participate or a fee for the facilitator did not exist. And the further education points were not a big issue either. But now that we have that, a small fee and CME points is certainly beneficial. [translated from Swiss German] (2).

So, I think if participants know that there is adequate compensation for the time they spend, then it is an important complement to intrinsic motivation. And naturally also the CME points. [translated from Swiss German] (5).

Well, I just think it's very different how a QC forms. There are people at the end of their career who are almost burnt out and want to exchange ideas, in the sense of improving their well-being. And at the other end of the spectrum, there are newcomers or beginners who are at the beginning of their GP career and are intrinsically highly motivated; they simply want to exchange experiences and clinical information [translated from Swiss German] (5).

Sometimes the organisation or network is more important. In a network all participants have to take part in QCs because it is a standard. Or you take part because you become simply more and more interested. Sometimes it starts as an obligation and becomes an intrinsic motivation] (4b).

Well, for me, if I look at it that way, there doesn't have to be a cause. I think the motivation to participate has to be there before, otherwise you wouldn't take part in QCs. But I think the logistical and practical support is important. First of all, the intrinsic motivation has to exist; obligation is an extra driver, as is administrative support; all that is important. [translated from Swiss German] (5).

So, I have the feeling that the incentives that are mentioned do not matter so much, but the philosophy and the attitude of the doctor. I believe that if he is committed to his profession, then a little money will simply speed up this process a little. [translated from Swiss German] (3).

I think it takes a basic motivation to understand the purpose of QCs and to invest 1½ hours to improve over and over again. I believe it takes a certain amount of reflection and openness to continue developing [translated from Swiss German] (3).

It simply needs something more, everything we have already discussed, but also something else; it is a kind of commitment to the profession and you want to feel comfortable in your position. [translated from Swiss German] (3).

I think intrinsic motivation is the basic requirement but it mostly takes an outside force to get different GPs to come together and actually take the time to do this [translated from Swiss German] (1).

Peer consulting is certainly a motivating factor for participating in QCs, but the networks create the structure to make it possible. Smaller monetary values only play a minor role, I think. [translated from Swiss German] (4b).

Personally, I would be motivated if I knew that someone with a lot of experience was facilitating the QC. But also, the subject-specific aspects are part of it, the peers know what they are talking about [translated from Swiss German] (4a).

In the beginning, we had no organizational help. In the course of time this has changed to the extent that two more QC participants joined the network because it is required that they participate, but it helps with organising them [translated from Swiss German] (2).

Yes, that they help to organize a room, that they help to take minutes, that they help us to develop our own initiative. You should also help us with the design of the content like evidence-based material [translated from Swiss German] (2).

So, it is important that there are rooms available that are easily accessible for everyone in terms of time. Up to now it has been over lunch. I think it is beneficial if there is some kind of catering available because most people go straight to the office afterwards. I think this logistical aspect is important [translated from Swiss German] (5).

There are certainly different needs in terms of location. Some people appreciate being able to do their QCs in the practice, others prefer to meet privately. Others may simply want a meeting room. We have sensed a variety of needs. Some really want to stay in their practice environment and others choose a completely different location [translated from Swiss German] (4b).

Context mechanism outcome configuration 4: **‘need for relatedness’**

If a steady group of members engages in socially enjoyable contact, led by a skilled facilitator who, e.g., introduces people to each other, opens discussions, clarifies and summarizes statements (C), then group members will get to know each other and norm rules that they are willing to follow and build safe environment based on trust (O), because members want to be among and to

interact with equals (M).

I think it is important that we define the basic arrangements, like time, place, etc., and the procedure; that makes us feel safe. And respect and standards must be established and discussed, and again and again. If this is done over and over again, there is also the possibility of improving everything, and gives the participants the opportunity to express themselves; I think this is important [translated from Swiss German] (6).

There are important cornerstones such as time, duration, division of tasks and also the process of a QC; it is also important to determine norms of communication with each other regarding feedback and communication culture. These two things are actually prerequisites for trust and security as a basis for open communication. I have never experienced stormy times, as often described in group development. I think you have to come back to this and discuss together what the rules of the game are. And if it doesn't work out that way, you can simply ask: where is the problem [translated from Swiss German] (2)?

The QC takes place in an open circle and with a facilitator who opens the discussion. He clarifies statements and summarizes. The activities at the beginning usually consist of case discussions. The session should be as open as possible at the beginning and everyone who has something on their mind should have their say [translated from Swiss German] /2).

In existing QCs, I think it would be good if the rules of the game were reasonably clearly defined [translated from Swiss German] (2).

The facilitators spend a relatively large amount of time determining the timing of the sessions so that it is convenient for everyone. I think this is a rather delicate process in which the group does not always reach consensus immediately. But with time, this will become part of the process. It's relatively important that you do it together and no one gets left behind [translated from Swiss German] (2).

By the way, I always put the basic points up for discussion, also with regard to respect and communication culture. That works somewhat differently in every QC. Individual groups have, how shall I put it, their own character [translated from Swiss German] (2).

It's important to discuss respectfully how to deal with each other, etc.; this is not only important for the development of the group, but also for what comes later in the QC in terms of the QI process. Sometimes small groups of people form who like each other from the past and this is not always helpful [translated from Swiss German] (5).

It was enormously important to me that the general conditions were made clear: when do we meet? where do we meet? how often? Then it was important for me that this wasn't a one-man show, where the facilitator didn't just do all the work, but that he had the competence to lead the group and distribute the tasks [translated from Swiss German] (5).

I think it also has to do with the fact that you get to know people better over time. You know what they are like, and if they don't always get along so well with each other, I can still ask them to be respectful to each other in the specific case [translated from Swiss German] (5).

With a glass of wine… it works best...The satisfaction in QCs, this concerns my own role, or it concerns my emotional situation, because I am basically more satisfied if I have had a fulfilling QC with my colleagues [translated from Swiss German] (3)

You have to set the rules at the beginning and if the rules are there, it works; and if the rules are not there, then some people don't know what to do and how to do it, and then it doesn't work. And from this I can only confirm: you need the rules [translated from Swiss German] (1).

Confrontation rarely happens, but when it does, it's usually not bad because it means that someone really .... that the group is really engaged and can participate in 'confrontation' at all. If someone is not involved, they will never get upset. And the moment someone gets upset, it means that they, the ones, who bring the topic into the group are extremely interested in what they do.... So, when it happens it is a very good step that leads to improvement. [translated from Swiss German] (1).

Actually, two things: one is that there is the framework we discussed before, and the other is that confidential things remain confidential. So that it really stays within the framework in which it's articulated and doesn't leave the room. [translated from Swiss German] (1).

This brings me to another aspect: because patient cases are discussed, it is very important that confidentiality and patient confidentiality are guaranteed. So, there must be a protected setting. I also have the feeling that this must be made very clear and that everyone in the circle agrees with it [translated from Swiss German] (4b).

I have the feeling that you have to do it as in a project team: in a new committee, you first agree on the joint procedure and record it in detail. In the session, they agree on how to communicate and how to organise things, and everyone has to say something about it or at least nod briefly [translated from Swiss German] (4a).

Context mechanism outcome configuration 5: **'need for autonomy and control'**

If the group chooses its own topics and facilitator (C), then they will feel they own the QC (O), because this satisfies their need for autonomy (a feeling of being in control of one' s own behaviour) (M).

So, I think it is important that they are always the same participants and that the place and time frame are clear, and the distribution of tasks. This simply promotes trust in QCs and on the basis of trust you can have discussions, from colleague to colleague. And that the QC can choose both facilitator and the methods they want to work with [translated from Swiss German] (4b).

Regarding autonomy, we are free to decide when, where and how long the QCs will last. In pilot tests, however, the duration has levelled off at 1½ hours. The network imposes certain conditions regarding certification. These require that we have to do a certain number of QCs per year and that we regularly review some topics but are free to choose the content [translated from Swiss German] (2).

Context mechanism outcome configuration 6: **'size of the group affects communication'**

If group size exceeds 15 (C), then interaction among group participants decreases (O) because participants cannot keep up with all participants and follow their conversations (M).

When the group became too big, there were no interactions among participants anymore. They all became listeners, and that was the main reason why we decided to split off and start a new QC [translated from Swiss German] (5).

The principle is that less technology helps and that the group sits in a circle and thus communicates better [translated from Swiss German] (5).

Learning environment

Context mechanism outcome configuration 7: '**feeling safe and not vulnerable'**

If participants trust each other (C), then they can disclose how they work and also the holes in their knowledge (O), because they feel safe rather than vulnerable (M).

So, it takes a lot of courage to talk about a [clinical] case, especially if it didn't go really well. And if someone does tell the story, then he is a role model, and others may have the courage to do the same and they gain trust on the one hand and, on the other hand, a certain feeling of togetherness [translated from Swiss German] (1).

It benefits the participants a lot, that's no question. I just ask myself how do we manage to take away 1½ to 2 hours from the working day without increasing the amount of work? Basically, this is probably an organizational problem. In an ideal world, we should have time to discuss things with each other and form a basis for identification, GP based, mutual trust, a discussion of sensitive issues, and trying something new together [translated from Swiss German] (3).

This is consistent and fits, I think this is exactly how the QC reveals knowledge gaps [translated from Swiss German] (3).

The QC takes place in an open circle and with a facilitator who opens the discussion. He clarifies statements and summarizes. The activities at the beginning usually consist of case discussions. The session should be as open as possible at the beginning and everyone who has something on their mind should have their say [translated from Swiss German] (2).

I have the feeling that QCs work and the chance of this increases if the QC takes place in a good atmosphere. Certainly, mutual trust is extremely important in the interaction. In the group, everyone has their own knowledge, which they make available to the group and thus increase the competence of the group [translated from Swiss German] (4a).

It would certainly be a good basis for discussion if you really had facts and not just the feeling of how you work with your patients, then you really have facts. But an atmosphere of trust is necessary so participants can discuss their data in the QC [translated from Swiss German] (4a).

Context mechanism outcome configuration 8: **'need for competence and self-actualisation'**

If the facilitator supports participants and encourages them to tell their stories and share their experiences in a safe environment by, e.g., encouraging interactive responses, discussions, and

summarizing statements, (C) then participants will be involved and share their experiences and failures (O), because they want to improve their competency (a sense of self-efficacy to achieve specific objectives) (M) and gain professional confidence (M), and achieve professional self-actualisation (M).

It's about your professionality as a doctor and in a case discussion you gain knowledge and learn a lot. Doing that, the doctors are totally focused on their work (4b) adds: that's why I have the feeling that such case discussions are an important basis for the process...if they are all peers, and everyone has experienced similar situations before, they can empower each other [translated from Swiss German] (4a and b).

And the case discussions are a very good way of getting into the subject. I often do it this way. At the beginning, however, we always start with a general opening, when everyone who has something very urgent to recount can ask questions, especially if she needs an answer for her clinical work [translated from Swiss German] (5).

This part of the programme theory is certainly correct. I do believe that QCs can relieve worries and fears, maybe even help you get rid of worries because you can discuss difficult things and share experiences that are tough [translated from Swiss German] (3).

The active participation in discussions of cases and personal experiences gives the feeling of group cohesion and a kind of understanding culture. There is also a feeling of openness and mutual support, and trust increases, a kind of collegiality. In this atmosphere, a collegial influence is possible and medical problems that are important to people are discussed [translated from Swiss German] (2).

This part of the programme theory also corresponds to my experience. I think the participants realize in these case discussions that they partly have the same problems. And this creates the feeling of belonging together as GPs and being in the same boat [translated from Swiss German] (5).

So, I think in the first part of the process, facilitators are very important because they stimulate people to actively participate. Facilitation is certainly important, but also the opportunity to discuss cases that are important to participants, that is basics [translated from Swiss German] (5).

Context mechanism outcome configuration 9: **'previous knowledge is activated'**

If participants exchange case stories and experiences while they actively listen to each other in the presence of a skilled facilitator in a safe environment (C), then they will share their knowledge by telling their own relevant stories (O), because the process activates knowledge they already possess (M).

We discuss clinical cases, we show where we make decision and mistakes... and then we try to work out the principles, how to go on... that's an important point, that you can relate difficult situations and the others support you and tell their stories [translated from Swiss German] (6).

So, in that setting, I think, you need your own case studies because otherwise, if someone doesn't talk about their own cases, then it's just another lesson in school and so the emotional involvement will be much, much lower and the interesting thing is, really, when someone gives something with heart and soul. And that lifeblood is then what motivates the others to participate [translated from Swiss German] (1).

Case discussions are important for the group. They are also exciting. We had chosen a broad topic in the QC that I facilitate. The topic of choice we made was actually an impossible one. We wanted to work on a guideline and then realized that it was completely useless. I then told the participants that they should simply take their own real-life examples for discussion, and that works well! [translated from Swiss German] (2).

Yes, exactly! You simply have to be open for any case vignettes that come from practice. They then form the basis for the topic that participants choose. For example, if someone asks you how to detect these 'damn' food allergies, what serological test to do. Then as a facilitator you have to get to the topic, so that everybody can understand and deepen their knowledge [translated from Swiss German] (5).

As a facilitator, I help the group to choose the relevant topics from the case discussions, which are then covered separately in a QC [translated from Swiss German] (5).

Context mechanism outcome configuration 10: **'immediate relevance for the practice'**

If QCs use the technique of experience-based learning (C), then knowledge becomes more relevant to GPs (O), because it relates to their everyday work and is therefore of immediate use (M).

In the last QC, the topic was euthanasia… and I had immediate use of something and was able to apply it. Discussing current cases…. I often realize that the problem is actually also about my patients and that the topic helps me in my everyday life [translated from Swiss German] (5).

It took some time before the discussion got going. At the end I asked them how they wanted to continue. The group was unanimous that they wanted to look at cases and then decide how to proceed based on the cases [translated from Swiss German] (2).

If the facilitator succeeds in actually uncovering the path of decision making, i.e. what the patient says and the doctor does with this... if he succeeds in working it out and communicating it in an emotional and lively way, then I think that something very important will happen. If the QC is like reading a textbook, then it won't help anyone. But if the group succeeds in tracing the path of a decision-making process and working out the critical aspects or pitfalls within the framework of this decision-making process, then the person who tells the case is personally affected. And in the moment when that person is personally affected and can express this, the rest of the group is usually also addressed and personally affected. And these are then the moments I recall, at least that's how I feel, and I will do that automatically, when I meet the next patient, and benefit from the discussion a great deal [translated from Swiss German] (1).

Context mechanism outcome configuration 11: **'cognitive dissonance'**

If participants discuss and reflect on their work processes (e.g. based on trustworthy data or exchange of personal experiences) during a professionally facilitated exchange of positive experiences or failures (C), then they discover knowledge gaps and identify learning needs and relevant topics (O) because their own attitudes and behaviours may contrast with their peers' knowledge, causing cognitive dissonance that makes them reconsider their way of working (M).

Prescription data.... that would be very helpful if I had access to prescription patterns by simple means, or laboratory tests, just go and have a look [translated from Swiss German] (2).

This seems familiar to me. I think we are in a special situation in our physician network, where we actively work with guidelines [translated from Swiss German] (5).

Our physician network collects statistical evaluations on a practical level, where they present us with the results and benchmarks. Of course, confidence-building measures play an important role in this process so that the group can discuss the results together. I don't think that this requires so much skill from the facilitator, because the statistics are stimulating enough and everybody wonders why he is where he is, statistically [translated from Swiss German] (5).

I don't think statistics cause fear but motivate people to change their behaviour and for example prescribe more generics if a patient requires, for example, a proton pump inhibitor. [translated from Swiss German] (5).

For example, when I look at all my referrals, I can't recall why I wrote them. Then, when I discuss this with my colleagues, my colleagues can explain ninety nine percent of the time a plausible reason for the referral and I can learn from these discussions. [translated from Swiss German] (5).

Yes, when seven to ten different opinions have been expressed, then the group should use evidence-based information. They just have to look up what is going on and revise their views. Sooner or later you always arrive back at guidelines. [translated from Swiss German] (3).

Yes, somehow participants must recognize and bridge the gaps that appear in the discussion. The QC is a good place to reflect on whether something is correct or not, or whether you have handled a situation correctly or not [translated from Swiss German] (3).

It is important that the group first comes to an issue, where there is some dissent, isn't it? [translated from Swiss German] (3).

Yeah, this is the part where the process moves into the QI. We don't just sit there and discuss cases; we reflect on them. I think about what I have heard and wonder whether I understood my colleagues correctly, it's all about self-reflection. I ask myself, is that true, do I do really do it that way, and why, and how could I do it better? Afterwards, the group then moves to the personal level of action, where quality in everyday practice improves. [translated from Swiss German] (4a).

I have the feeling that participants realize that someone else may be right, even if they don't admit it right away. I have the feeling that on the journey home or at home, or later at some point, especially facing similar cases, they think of the discussion. Yes, and then you do not automatically do what you have always done, but you start considering other possibilities for solving the problem. Then, participants may actually change their attitude and behaviour or consult a colleague or take a look in the books. [translated from Swiss German] (4a).

I believe it would be important to have data and to know what is going on in order to reflect on what we are doing and to improve the quality of our work [translated from Swiss German] (4a).

For example, if there is a topic that concerns a certain medication, then I hardly know how often I prescribed the drug in question. Then it's good if I can see in reality what I'm really doing. On the basis of routine data that can easily be compiled, GPs could find out how often they prescribe something, also compared to other colleagues in Switzerland [translated from Swiss German] (4a).

It would be good if we had prescription data on any clinical topic; you should be able to see what the reality is in practice on any topic. For example, we have done a feasibility study about drug interactions. Based on the data, GPs could recognise where the most common problems were and take action. [translated from Swiss German] (6).

Context mechanism outcome configuration 12: **'social learning'**

If the facilitator uses purposeful didactic techniques (e.g., brainstorming, contentious or consensus discussions, or role play) to keep the group active and to reward exploratory behaviour during reflection of the work process (C), then the group will create a learning environment that promotes knowledge exchange (O) because learning is a cognitive process in which participants observe and imitate their peers' behaviour to gain social approval (M).

I think it has a lot to do with interactive learning; thanks to the support of evidence-based information, we are all at the same level of knowledge - right? Afterwards we combine that with case discussions and that takes us further....an important step [translated from Swiss German] (5).

It is important in this phase as a moderator to actively request opinions from the group and not simply throw general questions at the group [translated from Swiss German] (2).

I think this exchange of knowledge in the group needs great trust and a safe climate. It's about confidence in dealing with discussions, in dealing with colleagues, so that they can show weaknesses. The others might think it's a funny story at first, but often they recognize themselves in it. The facilitator needs to ensure that the participants maintain respect and tolerance. After all, there are no false statements. A facilitator needs excellent training to be able to convey this feeling. And the training should be professional [translated from Swiss German] (3).

What helps me least, how shall I put it, are the quantifiable areas that can be measured as outcome. What helps me most is the path that leads to a decision. And measuring results afterwards is a tool for estimating roughly where I am moving to, but it has little to do with me as a person. But more importantly, I can develop professionally in a QC, I can learn how to take a decision and to make the process of decision making transparent [translated from Swiss German] (1).

If there is, perhaps, a need for clarification in the group. If some people say that they always do it for this or that reason and others reply that they judge the problem quite differently and therefore, they do it this way. It helps with evidence-based information and data that show how people really work. [translated from Swiss German] (4a)

So, whenever we look at our data, we start being distracted by exceptions and we lose the overall context, i.e. what is actually at stake. And when you have a sheet of numbers in front of you and you don't know how they came about; it becomes difficult to interpret. Misconceptions quickly happen and I have my doubts that if you just focus on a few small exceptions, that you see how GPs really work. Numbers should only be looked at in connection with case discussions [translated from Swiss German] (4b).

In order to account for the interviews data, I developed an additional context mechanism outcome configuration: '**Variety of characters stimulates reflection – stimulating cognitive dissonance'**

If members of the groups have individual character traits and describe differing professional experiences but accept each other's views (C), then they can learn from each other (O) because own attitudes and behaviours will contrast with their peers' knowledge and cause cognitive dissonance that makes them reflect on their way of working (M).

Social learning is not without conflict, but you have to be able to talk about different views without chopping each other's hand off.....and talk about different views...and that's sometimes a tightrope walk: how hard can I challenge someone - or do I have to treat someone gently? But I also think it depends on the person it concerns - if it's someone who's anxious, I'll approach them rather gently as a facilitator [translated from Swiss German] (2).

I can't remember if we've talked about this before. But there's one point missing, in the programme theory, and that's the idea that the group should have a say about who joins in. If the group is too different and everyone pulls in a completely different direction, it becomes difficult in QCs, but it gets difficult as well if the differences between participants are too small [translated from Swiss German] (2).

But I think GPs are generally people who want to get together and improve something.; so, they are somehow a selection, but a varied selection, otherwise it doesn't work either [translated from Swiss German] (5).

In order to account for the interviews data, I developed an additional context mechanism outcome configuration: **'threat to self-image' to account for the interviews data.**

If individuals cannot cope and integrate new knowledge (C), then they disrupt group dynamics and the QC process halts (O) because new knowledge threatens their self-image and they feel at risk of losing their professional identity (M)

There are exceptions of, of individuals who cannot accept anything in anyway and; they are self-seeking and cannot learn anything new, who then, even if they participate, are not able to understand anything or to change practice [translated from Swiss German] (4a).

And of course, with time, you trust each other. And you open up, and then you have to find out if people fit in or not; unfortunately, there are a few people who don't fit in. Then decisions have to be made, i.e. they have to leave; if they can't deal with the group or accept something new. Otherwise QCs can't work [translated from Swiss German] (6).

If there is a disrupting feature in the group that hinders the group from norming, then I have to deal with it. For example, if someone always withdraws, then I have to ask the individual, in front of the group or maybe better in private [translated from Swiss German] (2).

Adapting, creating and testing new knowledge

Context mechanism outcome configuration 13: **'interdependence between insurers / physician network organisations / national administrations and GPs'**

If national administrations require continuous QC activities (C), then QCs will negotiate priorities and design creative solutions(O) because the tension between autonomy and obligation spurs the group to act and negotiate together to reach a common goal (M).

I also think intrinsic motivation is an important point for someone to participate in a QC. But especially in our network, it is not only intrinsic motivation, it is also a requirement [translated from Swiss German] (5).

That is certainly a driver for improving quality and the physician network or the responsible organisation must then have resources to apply these results and at the same time support the QCs, for example with scientific knowledge [translated from Swiss German] (2).

I think I can sign up to these points of programme theory. In our case it is our network that forms and maintains the organization in the background, that supports the QC, but also requires participation [translated from Swiss German] (5).

I completely agree with the programme theory here and I think it points the finger at an important point. I could give you many examples to confirm this. You have to demand change to a certain degree [translated from Swiss German] (2).

It is the balance between autonomy and then still being able to demand something, even if it is mainly at the organisational level. As an incentive, small financial compensations for the participants come to mind [translated from Swiss German] (2).

The question is then, as many participants then of course may think, okay, I would like to devote myself to an important topic. But these topics should then also be important for the whole organisation and that may then have a stimulating effect [translated from Swiss German] (3).

Context mechanism outcome configuration 14: **'threat to professional autonomy'**

If GPs feel that the QC programme is only a top-down managerial intervention to reduce costs (C), then they will not be motivated and not participate (O) because they feel unsafe and lack autonomy in their clinical role (M).

no data

Context mechanism outcome configuration 15: **'interdependence among group members'**

If participants maintain a trusting learning environment that promotes knowledge exchange, assisted by facilitators who use professional techniques (e.g., contentious discussion, reaching consensus, and role play), (C), then participants will adapt and generate new knowledge for local use (O) because they see themselves as similar, and act and negotiate cooperatively to reach a common goal (M).

I was just thinking about the means to challenge the QC. Basically, I think you can stimulate a discussion, even a controversial one. Then the group debates, thinks in a circular fashion, uses role play and they stimulate one other to find new solutions. [translated from Swiss German] (5).

At the beginning of a QC, there is hardly any consensus in a group regarding therapy. But then, if you work on it in circles and look at it from different perspectives, and are motivated to improve, then there is an incentive within the group to align [translated from Swiss German] (5).

The reason why the group drafts such recommendations and continues to work on them is, I really think so, that the group says, 'okay' <u>we</u> need to discuss how to put it together and see if <u>we</u> can use it, and if a facilitator skilfully tackles that and steers the process in a good direction so the group participates, and then the group really does it and creates something new, they get the feeling that we've done it ourselves now [translated from Swiss German] (3).

Sometimes you don't understand it right from the start. But then you can say, okay, then I'll just try with a few patients for the next two or three months. Especially if something's a common problem. Then I can take a closer look at it again in the QC and slowly change my behaviour bit by bit [translated from Swiss German] (4a).

I can also well imagine the following happening, and it does in our case: someone reads an article and wants to discuss it in the group, because something new is recommended, something that should be changed in practice. But before I change something, I first want to know what my peers think about it. And I often see that it is only then that something new is actually introduced [translated from Swiss German] (4a).

Context mechanism outcome configuration 16: **'identifying and removing barriers to change'**

If participants, supported by skilled facilitators, address barriers to change (C), then they are more likely to implement the innovation (O), because participants help each other develop strategies to identify and overcome these barriers (M).

It is useful to identify barriers in advance, as for example in drug prescription projects. It increases the willingness to change. For example, there was a lot of resistance to the discussion of antidepressants, because most colleagues simply didn't want to change anything. It was good that we had discussed this in advance [translated from Swiss German] (5).

Innovations create opposition and nothing else is true. I think that's clear. And sometimes I have to bring it up, so that it becomes clear even before problems arise. We must then remain consistent and stick to our goal, even if we talk a lot about these barriers [translated from Swiss German] (2).

But I don't think barriers are a big problem, because you hardly ever put up relevant barriers if you are there, participating in the QC, and addressing and solving them during the process [translated from Swiss German] (2).

Context mechanism outcome configuration 17: **'need for competence**, **autonomy and relatedness'**

If participants create new knowledge and plan an implementations strategy (C), then they feel satisfaction, responsibility and stewardship (O), because this fulfils their need for competence (a sense of self-efficacy to achieve specific objectives) (M), autonomy (a feeling of being in control of one' s own behaviour) (M), and relatedness (a sense of connection to a larger group) (M).

We also have the feeling of togetherness when we go to the literature and read and discuss guidelines, but then agree that it is not always possible to follow them in all situations. We then somehow deviate somewhat from evidence-based medicine, but only for the good of the patient. We then feel on equal footing with the specialists, we work almost guideline compliant, and that creates professional identity [translated from Swiss German] (5).

It is important that the group jointly works through the pdca cycle. And then the facilitator - it doesn't always have to be just the facilitator, it can also be a participant - should make sure that you measure how it is and then again later, when everyone is changing in a similar way. Basically, this is the task of the facilitator, but the group acts as a regulating element for the individual, so that everyone participates, in the development and in the change of behaviour. And when the group has made progress, it feels good [translated from Swiss German] (3).

And you're satisfied because you were involved, and so you can relate to the content of the innovation, and that's probably why it works so well; it was well done and I can identify myself with it...and support it...and you feel like you developed it or helped develop it [translated from Swiss German] (4a).

Context mechanism outcome configuration 18: **'intention to change'**

If participants publicly announce their intention to change (C), then they are more likely to implement the change (O) because they and others in the group both think it is a good idea and they believe they can carry it through (M).

And that gives me the feeling of significance and satisfaction in QCs, when I've done something like this. And when I also intend to use [new knowledge... the facilitator helps me if he carries me through the PDCA cycle. In this phase, the facilitator is very important, important for planning, because he helps me when I have to plan; that is, when the members or at least one of them has decided to change behaviour [translated from Swiss German] (2).

Repeating the process

Context mechanism outcome configuration 19: 'testing new knowledge'

If participants validate and test new knowledge in a QC moderated by a skilled facilitator in a safe environment (C), then they feel safe to put that knowledge to use in everyday practice (O) because they have had the opportunity to practise and familiarise themselves with the innovation (M).

No data

Context mechanism outcome configuration 20: **'gaining confidence in an innovation'**

If the group iteratively practices implementing and coping with an innovation (C), then they trust their own competence and turn the innovation into a habit (O) because successful outcomes build up confidence in their abilities (M).

Is a sustainable change taking place? I think yes, but just, if I am completely honest, I have to tell you that I cannot always prove it. I just think that if it were documented, i.e. if the process in the QC were well documented, the change would be more sustainable. And when you see that it works, it is even more motivating and shows that the QC is a good thing [translated from Swiss German] (2).

But to recognise whether the process actually leads to a change in my own behaviour, I have to have an outside indicator that shows it to me, time and again. In principle, this means that I have to have an external objective assessment of what I am doing and whether anything is changing - and this helps to change my behaviour and to gain confidence in [translated from Swiss German] (1).

Right. Because that is the ultimate question: if I wanted to change something, then something should change and if nothing has changed, then it is somewhere on the way between wanting it and being stuck; but if I see that it starts working, it is very motivating and I continue [translated from Swiss German] (1).

Context mechanism outcome configuration 21: ‘‘**repetition priming and automaticity**’

If participants build a steady group and practice using QI tools (C), then they will successfully implement new knowledge into everyday practice (O) because successful responses increase with repetition: ‘practice makes perfect’ (M).

I facilitate a QC there and notice that the motivation has rather increased over the years because the participants have realized what benefits they get from it. But in the beginning people were extremely critical and passive. [translated from Swiss German] (2).

That is totally exciting, when you see that the participants choose the same or similar topics, but they deal with them in a very different way and they go deeper into the topic [translated from Swiss German] (2).

It is a fact that you use the same techniques, over and over again, in terms of methodology - and don't even notice it...so, even if you don't notice it, it helps [to improve quality in PHC], that's for sure, that’s absolutely right [translated from Swiss German](3).

But a lot of things are just as I have just described, and it is effectively the case that local autonomy is important for the implementation of innovations. The organisations must regard this as important, and the new knowledge must be available on a platform, so that it can be exchanged again and again, and looked at until it is established [translated from Swiss German] (3).

Well, I have had varying experiences; one is that you have to think in great detail and do the same procedure over and over again. But if, over a longer period of time, this same process has become established, and the thinking within the group becomes more similar, or they become, how should I put it, part of this, this, this basic cycle, then sometimes you can skip elements and make fairly rapid progress. It is a question of routine [translated from Swiss German] (1).

I can also see that it takes a long time and that it takes two or three QC sessions before an improvement is achieved. Therefore, you have to keep addressing the problem and thus initiate a repetitive process [translated from Swiss German] (4b).

Appendix 8.4 Results of the focus group sessions

Focus group: summary of agreement / disagreement

Conference Workshop: April 24th

Participants: 21

Quality Circles: what works for whom and why

Adrian Rohrbasser / Sharon Mickan / Janet Harris

I. Read the summary statements

II. Think about your own groups while considering the statements

III. Consider the ones that are different in your group

IV. Add your comments to the statements

1 Statement

If an invitation to a meeting with general information on QCs addressing GP needs is issued and a facilitator, preferably a GP, introduces QCs and explains how they work

then the meeting takes place and people become familiar with the theoretical background of the QC model

provided that the venue is close to the working place and time convenient and/or CME Points are offered.

Agree ☐

Disagree ☒ / unsure Why? Please explain below:

4 out of 21 disagree or are unsure

Too many invitations: invitation has to be personal (not further explained although facilitator asked)

Facilitator needs a reward because of "more work"

2) Statement

If a GP, as part of the team, is introduced into the group as a facilitator

then QCs are more relevant to the participants and a sense of ownership is created

provided that the GP has completed 2 days' training in facilitating structured small group work

Agree ☐

Disagree ☒ /unsure Why? Please explain below:

5 out of 21 disagree or are unsure

Denmark: Flat democratic structure; all members have facilitator training and therefore they have an understanding of the role of a facilitator; role of facilitator rotates.

People feel safe when there is equality about facilitation

Swiss participant: the group needs a leader and training in leadership, continuous and updated training in leadership.

Germany: Facilitation needs qualification and training and financial compensation. Financial resources to train facilitators are important.

Facilitator should be a GP but other professionals may have the skills. Facilitators need respect and understanding for GP environment.

The leader must be accepted by the group – formal or informal -. Training in leadership should be part of GPs' training

Uncertain whether 2 days are enough: description of hours and content are needed.

Spain: content is more important than hours or days!

Talented Facilitators need to be able to motivate - clear leadership is required.

Shared facilitation is possible

Separate group leader and facilitator are also possible: separate group leader and separate facilitator during the meeting.

3) Statement

If objectives, both for the team as a whole and for individual team members are discussed, including the venue, duration and frequency of meetings, as well as individual tasks, such as writing the minutes

then the group forms and develops a basic level of trust

provided that the facilitator introduces people to each other, opens discussions, clarifies and summarizes statements in a group arranged in a circle without barriers, such as screens.

Additional context features: professional and administrative autonomy are needed as well as rooms and equipment.

Agree ☐

Disagree ☒ / unsure Why? Please explain below:

2 out of 21

4) Statement

If social norms are discussed, for instance punctuality and how people interact with each other and if further tasks within the group are talked over

then group bonding develops and the level of trust increases

provided that professional and organisational autonomy are granted

Agree ☐

Disagree ☒ /unsure Why? Please explain below:

1 out of 21

5) Statement

If people can present their clinical cases and share their experiences

then people will be satisfied with the group process

provided that the facilitator ensures interactive responses and respects each member's contributions.

Additional context features: organizational barriers and excessive demands for the meetings have to be avoided.

Protected time is offered: the meeting takes place during working hours and participants are freed from clinical duties during the sessions.

Agree ☐

Disagree ☒ / unsure Why? Please explain below:

7 out of 21

It has to take place during working hours

Confidential atmosphere and mutual respect for each other

Sharing experiences is enough the beginning

After 2- or 3-years people become more expert in the process of QCs

People need a clear agenda (facilitator tried to clarify what that meant – could not be clearly explained)

Shared responsibility for the content is necessary; the whole group has to set the agenda and prepare the content

Each session is slightly different

Delegate ownership for different sessions (???)

Moderator has to ensure that the group works

You have to clarify roles and responsibilities

6) Statement

If the group discusses case reports and experiences

then people will participate actively and relate to the group

provided that the facilitator elicits open communication

Agree ☐

Disagree ☒ / unsure Why? Please explain below:

4 out of 21

Cases are accepted as common agendas

Safe environment and mutual respect for each other

Leader starts to show vulnerability and others will follow (leadership or facilitator = role model)

It is better to have big questions about new laws, policy and practice; a single case is not enough; the issue should affect all people

Sharing emotionally difficult cases: if difficult for one, then difficult for others: helping each other. For instance, Critical Incidence feels like relief for others and is therefore seen as important.

Need to have mutual goal, how to define a purpose. Leaders and members have to define the goal.

You should negotiate the topic with all members

Needs of the group change over time

Democratic process

7) Statement

If the group discusses difficult experiences that burden participants

then others will appreciate their professional role and group identity increases

provided that confidentiality is guaranteed within the group and granted even at an organizational level

Agree ☐

Disagree ☒ Why? Please explain below:

1 out of 21

8) Statement

If clinical cases are presented and different opinions discussed

then interactive learning and personal reflection on action take place

provided that the facilitator involves all QC members with an appropriate balance between comfort and challenge, depending on what level of trust the group has reached.

Agree ☐

Disagree ☒ Why? Please explain below:

1 out of 21

9) Statement

If the group contemplates clinical cases and mirrors their practice by looking at diagnostic patterns or prescription habits and discusses emerging topics in the light of evidence-based

information

And/Or

If the group reflects on video consultations or results of patient satisfaction surveys

And/Or

If the group meets up with a local opinion leader and reflects on clinical scenarios

then people increase their understanding and gain insight into gaps in knowledge

provided that the facilitator establishes and maintains a learning environment and acts cautiously when addressing performance.

Additional context features: the management supports QCs to improve performance by allowing autonomy while setting expectations. Access to scientific knowledge, practice guidelines, quality indicators, a performance management system and an electronic medical record are provided to mirror current practice.

Agree ☐

Disagree ☒ Why? Please explain below:

3 out of 21

It might increase

Need to look and analyse

Feedback is important to each other

Measurement and data triggers discussion

Data is an important tool

Need to learn about data / skills to analyse and interpret / trust data

Data is supported by AQA institute for discussion in QCs – it took a long time to build trust and confidence

After QC: people have to move towards agreement, consensus

10) Statement

If the facilitator uses different techniques to reflect practice, such as brain-storming, followed by

contentious discussions and reaching a consensus, professional reprocessing of patient situations and role play, raising awareness of emotions, and purposeful use of local experts

then new knowledge is created

provided that the management accepts that acknowledging unstated beliefs about innovations is essential for creating new knowledge.

Additional context features: the management values QC contributions to the organization. Local adjustments of knowhow are allowed in order to customize knowledge and organizational pluralism is accepted.

Agree ☐

Disagree ☒ Why? Please explain below:

4 out of 21

Management: level above QCs

Change techniques to reflect gradually - group develops and learns different ways

You should stick to the same technique

Mature group will change ways of working more easily; choose technique to fit the problem

Check if right technique is used after the session

11) Statement

If participants in the group compare their experiences and current practice with each other and with evidence-based information using different facilitating techniques like contentious discussion and reaching a consensus

then new knowledge is validated and corroborated

provided that the management agrees on shared decisions when it comes to the use of new knowledge and accepts a certain degree of diversity in the organization.

Agree ☐

Disagree ☒ Why? Please explain below:

1 out of 21

12) Statement

If the facilitator helps the group or the individual to make a binding plan of what they want to change in the light of new knowledge

then participants make a commitment to change

provided that the management agrees on shared decisions when it comes to the use of that new knowledge.

Agree ☐

Disagree ☒ Why? Please explain below:

3 out of 21

Continuous reflection

As knowledge increases plans evolve

Plan also needs a follow up PDCA

Facilitate change

Binding plan – make participants aware of, engage, participate from start creates ownership

Nothing changes – need social, financial incentives to change

Long term commitment

13) Statement

If the group discusses factors that hinder or foster implementation of new knowledge or change of practice and carefully evaluates adjustments to local conditions

then people use that new knowledge at their working place

provided that the management supports social processes that form and circulate knowledge and accepts a certain degree of diversity in the organization

Agree ☐

Disagree ☒ Why? Please explain below:

1 out of 21

14) Statement

If the group compiles detailed information about how to follow progressive goals and continuously evaluate new knowledge

then new knowledge is systematically used and evaluated in the working place

provided that the management supports social processes that form and circulate knowledge and assists in carrying out the tasks

Agree ☐

Disagree ☒ Why? Please explain below:

4 out of 21

Not everyone will follow

Doing a little bit better is always good

Small change is achievable

Group may need different targets

Need monitoring feedback

Reflections

Differences in funded and free QCs

Nothing about financial support

Conference Workshop April 25th

12 Participants

Quality Circles: what works for whom and why

Adrian Rohrbasser / Sharon Mickan / Janet Harris

I. Read the summary statements

II. Think about your own groups while considering the statements

III. Consider the ones that are different in your group

IV. Add your comments to the statements

1) Statement

If an invitation to a meeting with general information on QCs addressing GP needs is issued and a facilitator, preferably a GP, introduces QCs and explains how they work

then the meeting takes place and people become familiar with the theoretical background of the QC model

provided that the venue is close to the working place and time convenient and/or CME Points are offered.

Agree ☐

Disagree x Why? Please explain below:

4 out of 12

Denmark: don't wend out invitations (what other ways of contacting and offering training – Facilitator tries to investigate – no answer) – no CME points should be offered

CME points are important, but not the most important reason to attend

A sent invitation is not enough – "it does not make sure that a person will attend"; link invitations to an existing system. Organisational structure makes the difference, for instance networks.

Use external motivator, for instance money to get there = trigger similar to CME points.

Need information to be informed about QC (facilitator asks for further explanations without success)

Convenient location is important

2) Statement

If a GP, as part of the team, is introduced into the group as a facilitator

then QCs are more relevant to the participants and a sense of ownership is created

provided that the GP has completed 2 days' training in facilitating structured small group work

Agree ☐

Disagree 4 Why? Please explain below:

4 out of 12

Facilitators don't have to be GPs

On order to receive CMEs, there has to be a moderator (=facilitator)

In Norway, training takes two years to become a facilitator and three years' of GP facilitation (not confirmed by other members und not confirmed in the literature)

Bottom up system in QCs creates natural leaders

The facilitator has to be part of the group: flat hierarchical structure creates sense of ownership

Members of the group offers to be facilitator

Not all groups have a facilitator; all are equal (Denmark)

Another Danish participant: the group leader is the administrative secretary, teacher and facilitator comparable to the role of a CEO

In Denmark, all participants attend moderator courses and can lead....

3) Statement

If objectives, both for the team as a whole and for individual team members are discussed, including the venue, duration and frequency of meetings, as well as individual tasks, such as writing the minutes

then the group forms and develops a basic level of trust

provided that the facilitator introduces people to each other, opens discussions, clarifies and summarizes statements in a group arranged in a circle without barriers, such as screens.

Additional context features: professional and administrative autonomy are needed as well as rooms and equipment.

Agree ☐

Disagree x Why? Please explain below:

5 out of 12 disagree

You should not have any barriers like screens at all, they are distracters and should be removed

Physical arrangement of people is important, there has to be enough space

Rearrange classroom to interaction

4) Statement

If social norms are discussed, for instance punctuality and how people interact with each other and if further tasks within the group are talked over

then group bonding develops and the level of trust increases

provided that professional and organisational autonomy are granted

Agree ☐

Disagree x Why? Please explain below:

3 out of 12

Start with clinical discussions before you set norms!

Talk about basic rules at the first meeting

Address these topics – like social norms – after the group has been together – need trust to have a discussion.

1 sheet of paper = rules for the group = pass out in the 1st QC – these rules can be changed; after 3 – 4 meetings set a discussion to confirm the rules

As group norms grow, social control increases

If you discuss which rules the group has, it improves trust.

5) Statement

If people can present their clinical cases and share their experiences

then people will be satisfied with the group process

provided that the facilitator ensures interactive responses and respects each member's contributions.

Additional context features: organizational barriers and excessive demands for the meetings have to be avoided.

Protected time is offered: the meeting takes place during working hours and participants are freed from clinical duties during the sessions.

Agree ☐

Disagree x Why? Please explain below:

8 out of 12 disagree

Meeting doesn't not necessarily have to take place during working hours, really not necessary

It should be out of working hours evening or during lunch time

The group should decide on this

6) Statement

If the group discusses case reports and experiences

then people will participate actively and relate to the group

provided that the facilitator elicits open communication

Agree ☐

Disagree x Why? Please explain below:

1 out of 12

7) Statement

If the group discusses difficult experiences that burden participants

then others will appreciate their professional role and group identity increases

provided that confidentiality is guaranteed within the group and granted even at an organizational level

Agree ☐

Disagree x Why? Please explain below:

1 out of 12

8) Statement

If clinical cases are presented and different opinions discussed

then interactive learning and personal reflection on action take place

provided that the facilitator involves all QC members with an appropriate balance between comfort and challenge, depending on what level of trust the group has reached.

Agree ☐

Disagree x Why? Please explain below:

1 out of 12

9) Statement

If the group contemplates clinical cases and mirrors their practice by looking at diagnostic patterns or prescription habits and discusses emerging topics in the light of evidence-based information

And/Or

If the group reflects on video consultations or results of patient satisfaction surveys

And/Or

If the group meets up with a local opinion leader and reflects on clinical scenarios

then people increase their understanding and gain insight into gaps in knowledge

provided that the facilitator establishes and maintains a learning environment and acts cautiously when addressing performance.

Additional context features: the management supports QCs to improve performance by allowing autonomy while setting expectations. Access to scientific knowledge, practice guidelines, quality indicators, a performance management system and an electronic medical record are provided to mirror current practice.

Agree ☐

Disagree x Why? Please explain below:

3 out of 12

Management is the level above the GP level (explanation ADR) Wrong word? Authority was proposed, accountability, government

Denmark: GPs are the managers! (facilitator points out that these GPs play a different role then – as mangers – even if it is the same person: for instance – QC during working hours – managerial decision even though it is taken be a GP in the role of the manager...)

Danish participant: There are different levels above the GP: medical association – they teach, supervise and facilitate

There is a different impact if a local opinion leader leads the QC

When there is no support, the group manages itself

10) Statement

If the facilitator uses different techniques to reflect practice, such as brain-storming, followed by contentious discussions and reaching a consensus, professional reprocessing of patient situations and role play, raising awareness of emotions, and purposeful use of local experts

then new knowledge is created

provided that the management accepts that acknowledging unstated beliefs about innovations is essential for creating new knowledge.

Additional context features: the management values QC contributions to the organization. Local adjustments of knowhow are allowed in order to customize knowledge and organizational pluralism is accepted.

Agree x

Disagree ☐ Why? Please explain below:

11) Statement

If participants in the group compare their experiences and current practice with each other and with evidence-based information using different facilitating techniques like contentious discussion and reaching a consensus

then new knowledge is validated and corroborated

provided that the management agrees on shared decisions when it comes to the use of new knowledge and accepts a certain degree of diversity in the organization.

Agree x

Disagre e Why? Please explain below:

12) Statement

If the facilitator helps the group or the individual to make a binding plan of what they want to change in the light of new knowledge

then participants make a commitment to change

provided that the management agrees on shared decisions when it comes to the use of that new knowledge.

Agree x

Disagree ☐ Why? Please explain below:

13) Statement

If the group discusses factors that hinder or foster implementation of new knowledge or change of practice and carefully evaluates adjustments to local conditions

then people use that new knowledge at their working place

provided that the management supports social processes that form and circulate knowledge and accepts a certain degree of diversity in the organization

Agree x

Disagree ☐ Why? Please explain below:

14) Statement

If the group compiles detailed information about how to follow progressive goals and continuously evaluate new knowledge

then new knowledge is systematically used and evaluated in the working place

provided that the management supports social processes that form and circulate knowledge and assists in carrying out the tasks

Agree ☐

Disagree x Why? Please explain below:

3 out of 12

Denmark: the results (data) should not be discussed in the group

Too optimistic, the group won't change as much as we (?) hope

Clarification of compile: minimal documentation about how to proceed (?)

Pre survey in each QC for each practice; post survey and qualitative data could show change

Workshops in Fischingen: Summary of participants' ideas about mechanisms of the programme theory

1. Summary statement: participation in the meeting is accepted when General Practitioners' needs are addressed and logistical barriers to attending are identified and tackled during the initial phase of the program.

Process outcome: People are familiar with the theoretical background of QC model

Activities: invitation to an informative meeting with general information on QCs, addressing GP needs. A facilitator, preferably a GP, introduces QCs and explains how they work.

Context: Venue is close to working place and time convenient; CME Points are offered.

Mechanisms: "Reasoning"

M1 People feel they have an important stake so participate

M2 People are engaged in their work, want to learn autonomously and therefore decide to participate

M3 People think the meeting will lead to self-satisfaction and reward.

M4 People seek new challenges in new areas and expect that these will increase their competence and help them relate to colleagues.

M5 Social pressure makes them participate because of membership in a network and the associated responsibilities of joining QCs.

M6 Health insurance companies identify GPs using resources inadequately and make them participate.

2. Summary statement: involving GPs as facilitators as part of the team in QCs leads to interventions being more relevant to participants' needs and creates a sense of ownership by those delivering and receiving the intervention.

Process outcome: Group is facilitated in a professional way

Activities: A GP who is trained in facilitating structured small group work is introduced into the group

Context: A GP has completed 2 days' training in facilitating structured small group work

Mechanisms: "Reasoning"

M1 since it is a GP who facilitates the program among other GPs, it becomes more relevant to participants and creates a sense of ownership.

M2 a facilitator who is a GP gains more credibility - the facilitator is perceived by the participants to be 'one of us'

3. Summary statement: group bonding and a basic level of trust develop when the group autonomously decides on the structure of its meetings with the help of a trained facilitator in an open atmosphere without barriers.

Process outcome: Group Forming and basic level of trust

Activities: The facilitator introduces people to each other, opens discussions, clarifies and summarizes statements. Objectives, both for the team as a whole and for individual team members are discussed. Venue, duration and frequency of meetings are discussed, as well as individual tasks like writing the minutes.

Context: At an organizational level: professional and administrative autonomy are needed as well as rooms and equipment.

At a group level: group is arranged in a circle without barriers, such as screens

Mechanisms: "Reasoning"

M1 The group members feel familiar with what they are going to cover and are able to participate actively.

4. Summary statement: the social structure and the level of trust grow when the group autonomously decides on social norms like punctuality and feedback culture, with the help of a trained facilitator, provided that they are discussed and agreed upon in an open atmosphere without barriers.

Process outcome: Group Norming and increased level of trust

Activities: The facilitator opens discussions in the group, clarifies and summarizes statements as they discuss the ground rules of how people interact with each other. People are introduced to each other at a deeper level and resolve possible differences. Social norms like punctuality and further tasks within the group are talked over.

Context: At an organizational level: professional and administrative autonomy are needed as well as rooms and equipment.

At a group level: group is arranged in a circle without barriers, such as screens

Mechanisms: "Reasoning"

M1 The group members feel familiar with the group and are able to relate to each other.

5. Summary statement: Presentation of own clinical cases in a well facilitated group increases the feeling of reassurance and being acknowledged in the group, and increases self-esteem. Protected time, no excessive demands and no organizational barriers are prerequisites of this process.

Process outcome: satisfaction with the group process.

Activities: People present their clinical cases and share their experiences. The facilitator ensures interactive responses and respects each member's contributions.

Context: There are neither organizational barriers nor excessive demands for the meetings. Protected time is provided: the meeting takes place during working hours and participants are freed from clinical duties during the sessions.

Mechanisms: "Reasoning"

M1 By reconfirming their practice among colleagues, the feeling of security and predictability is increased.

M2 A sense of affiliation to the group and being acknowledged grows when common experiences are shared.

M3 When colleagues actively listen to experiences, it increases self-esteem.

6. Summary statement: discussion of case reports makes the group active and creates a supportive and understanding culture among participants.

Process outcome: Active participation and relatedness to the group

Activities: the group discusses case reports and experiences with help of a facilitator, who elicits open communication.

Mechanisms: "Reasoning"

M1 Family physicians are engaged in their work and focus on relevant, practical knowledge that is of immediate use to them.

M2 Common experience creates mutual understanding and gives a sense of collegiality.

7. Summary statement: discussion of difficult experiences and exchange of emotional responses provides recognition of professional roles and increases group cohesion if confidentiality is guaranteed at a group and organizational level.

Process outcome: Appreciation of professional role and increase in group identity.

Activities: the group discusses difficult experiences that burden participants. The facilitator leads the discussion and supports narrators through active listening techniques.

Context: Confidentiality is guaranteed and granted, even at an organizational level

Mechanisms: "Reasoning"

M1 Family physicians are engaged in their work and focus on relevant, practical knowledge that is of immediate use to them.

M2 Common experience creates mutual understanding and gives a sense of collegiality.

8. Summary statement: case discussions as a basis of challenging each other's position enable the group to reflect on their practice and to learn from each other in a cooperative atmosphere of mutual understanding.

Process outcome: Interactive learning and personal reflection on action

Activities: clinical cases are presented and different opinions discussed. The facilitator involves all QC members with an appropriate balance between comfort and challenge, depending on what level of trust the group has reached.

Mechanisms: "Reasoning"

M1 Previous knowledge is activated through case discussions.

M2 The group supports and rewards exploratory behaviour by giving the feeling of competency, which enables participants to describe what they actually do.

M3 People are motivated to imitate those peers who are more competent and then receive positive feedback.

9. Summary statement: when facilitators use different prompting techniques, they allow the group to reflect on their practice and acknowledge gaps in knowledge. The facilitator cautiously addresses performance while the management provides appropriate and trustworthy data.

Process outcome: Understanding and insight into gaps of knowledge

Activities: The group contemplates clinical cases and mirrors their practice by looking at diagnostic patterns or prescription habits. Emerging topics are discussed in the light of evidence-based information. The facilitator establishes and maintains a learning environment and acts cautiously when addressing performance.

The group reflects on video consultations or results of patient satisfaction surveys. The group meets up with a local opinion leader and reflects on clinical scenarios.

Context: the management supports QCs to improve performance by allowing autonomy while setting expectations. Access to scientific knowledge, practice guidelines, quality indicators, a performance management system and an electronic medical record are provided to mirror current practice.

Mechanisms: "Reasoning"

M1 Previous knowledge is activated through case discussions.

M2 The group supports and rewards exploratory behaviour by giving the feeling of competency, which enables participants to describe what they actually do.

M3 People are motivated to imitate peers who are more competent and receive positive feedback.

M4 Critical reflection on experience and practice enables practitioners to identify learning needs.

M5 Addressing performance may cause anxiety and frustration among participants.

10. Summary statement: The group creates new knowledge when they mirror and reflect current practice in a well facilitated learning environment, given that the management values their contributions.

Process outcome: Creation of new knowledge

Activities: The facilitator uses different techniques to reflect practice, such as brain-storming, followed by contentious discussions and reaching a consensus, professional reprocessing of patient situations and role play, raising awareness of emotions, and purposeful use of local experts.

Context: Management accepts that acknowledging unstated beliefs about innovations is essential for creating new knowledge and values QCs' contributions to the organization. Local adjustments of knowhow lead to customized knowledge and fit into organizational pluralism.

Mechanisms: "Reasoning"

M1 Previous knowledge is activated through discussions of current practice

M2 People are motivated to imitate peers who are more competent and receive positive feedback.

M3 Critical reflection on experience and practice enables practitioners to identify new knowledge.

M4 Family physicians are engaged in their work and focus on relevant, practical knowledge that is of immediate use to them.

11. Summary statement: Provided that the management acknowledges and accepts QC contributions, the group appraises and modifies new knowledge when they compare their experiences with each other and with evidence-based information.

Process outcome: Validation of new knowledge

Activities: Participants of the group compare their experiences and current practice with each other and with evidence-based information, using different facilitating techniques, such as contentious discussion and reaching a consensus.

Context: the management agrees on shared decisions when it comes to the use of new knowledge and accepts a certain degree of diversity in the organization.

Mechanisms: "Reasoning"

M1 The group supports and rewards exploratory behavior by giving the feeling of competency, which enables participants to test new knowledge.

M2 Analytical reflection on experience and practice enables practitioners to critically appraise new knowledge.

12. Summary statement: When the group or individuals develop their plan of change it becomes a binding arrangement, provided that the management values their ideas regarding the use of new knowledge.

Process outcome: Commitment to change

Activities: the facilitator helps the group or the individual to make a binding plan of what they want to change in the light of new knowledge

Context: the management agrees on shared decisions when it comes to the use of new knowledge

Mechanisms: "Reasoning"

M1 New knowledge that has been acquired in a learning environment influences individual perception concerning the perceived risks and benefits of making a change and allows a change of attitude and commitment to change (Health Belief Model)

M2 Individuals of a group take into account the social norms and practices of their peers when they take in knowledge and implement it (theory of reasoned action)

13. Summary statement: the use of knowledge or skills in the working place is fostered when the group is endorsed by the management in making local adjustments and in removing barriers to innovations.

Process outcome: Use of knowledge in the working place

Activities: The group discusses factors that hinder or foster implementation of new knowledge or change of practice and carefully evaluates adjustments to local conditions.

Context: The management supports social processes that form and circulate knowledge and accepts a certain degree of diversity in the organization.

Mechanisms: "Reasoning"

M1 *People feel that they are in control of and empowered by the process.*

M2 *As people have developed new knowledge or skills themselves, they have confidence in their ability to take action.*

M3 *The commitment to change creates a sense of urgency to use new knowledge or skills.*

M4 *People believe that new knowledge or skills they developed themselves are relevant and important to them.*

14. Summary statement: people can put new knowledge or skills into systematic use when they plan progressive goals they can follow under the guidance of a facilitator, in agreement with the management.

Process outcome: Systematic use of new knowledge in the working place and re-evaluation

Activities: Under the watch of the facilitator, the group compiles detailed information about how to follow progressive goals and continuously evaluate new knowledge.

Context: The management supports social processes that form and circulate knowledge and assists in carrying out the tasks.

Mechanisms: "Reasoning"

M1 *Social support and guidance in using new knowledge increases the ability to take action*

M2 *Confidence in the group's ability to take action increases when they use progressive and iterative goals*

M3 *Anxiety is reduced when the group demonstrates desired behaviour.*

Appendix Chapter Nine

Appendix 9.1 Quotes of interviews in Phase IV

(1) GP in a rural practice, teacher at the University of Ghent (GP from Belgium)
(2) GP in a rural practice, small group educator for 18 years (GP from Ireland)
(3) Certified facilitator in GP vocational training, active in quality improvement and patient safety (GP from Norway).
(4) GP working in an urban area, facilitating a QC, researcher (GP in training from France)
(5) GP in a rural practice, teacher for GP vocational training (GP from Croatia).

Additional interviews: consolidation of the programme theory

Preconditions

'Need for autonomy and obligation'

If the administration at the national level or at the level of health insurance companies entrusts GPs with QI and autonomy (puts them in control of how to do it) (C), then GPs may consider participating in QCs (O) because they feel they can take on the responsibility and make a difference (M).

…we had quite a lot of criticism on the whole system because we did not feel it would really enhance quality and it was just used as a way of getting more money to the doctors without guarantees that quality would be enhanced, which is when we look back 25 years later, is exactly what happened. So, we got more money but it was for the government no value for money well extra value for the money. The only obligation was to participate in the local QC which had to gather four times a year, and you had to participate at ….at least two of them every year to keep your accreditation. But you should have an obligation to improve Your quality in your practice (1).

…., the only thing that is happening is at the national level the one who is responsible for the QC has to fill in after every QC who has been there and what was the subject of the meeting ... exactly there are no demands (1).

It may be important for the emerging of QCs, that it becomes a mandatory thing (4).

We have as an obligation in contracts with our insurance to have …… … peer groups…… then ... I don't know how many times we should meet, actually. But we don't have or get much money out of this (5)

'Feeling of having a say'

If an organisation, (e.g., a physician network organisation) has a decentralised policy that

encourages use of local knowledge (C), then the QC takes on tasks (O) because members feel that they have a say in QI in their practice (M).

No data but confirming comments.

'Participants know what to expect'

If the introductory workshop teaches the principles of QI in PHC and the workings of QCs (social persuasion) (C), this will increase the motivation of future participants to join QCs (O) because they learn what to expect and may feel that they are capable of meeting expectations (M).

…they (QCs) are free to choose to what group they participate without any regulation and without any support of what is happening there without any control of what is happening there so ... some of them will work well (depending) whether there is somebody who is inspired and wants to take the lead and know something about peer review but most of them are just nice meetings to see colleagues and ... have somebody have a presentation or drink something and food. So, you should really teach them first! (1).

They get the knowledge about that from … … … the tutors, when they meet at these national workshops, of which there are three, they exchange ideas on useful quality tools and ways to use these tools among the groups and among the participants (2).

…because they paid for it and but ... there has not been enough understanding in the medical corps to ... to do it and usually comes on top of all the other …. (3).

'Quality Circles should be embedded in a system'

If QCs are embedded in a QI system (an organisation that negotiates and signs contracts with governmental bodies or health insurance companies, trains and supervises facilitators, provides courses on QI in PHC, and easy to access educational material, timely data on practice performance, and protected time and space) (C), then participants will take on responsibility and work in a purposeful way (O) because they feel supported, empowered, and capable of meeting expectations (M).

But ... what did not happen is that the system of local QCs was really embedded in a movement or a way that would support people who participate that would make sure that people who took the lead really would support the facilitator the right way (1).

…by making a plan I mean having enough support on the content level which is there but also at the organisational level m... making it possible (to support facilitators) I do believe that the facilitator is very important (1)

…, the facilitator is the …at the start we …had some facilitator training a... 20 years ago, for some of the people who were interested but then that stopped because it was not financed by the government, and not supported anymore, a... and now for about 15 years there has not been a good generic facilitator training for those people who want to take on responsibility. And the ones who do that, it will be in their spare time they will not be paid for doing that e awarded in another way (1).

I can only tell that in our university in Ghent, that is one of the eight universities in Belgium, we try to learn (teach) the students during the last year, to work in peer review groups and then in the continuous education, the vocational training, they have to meet every two weeks, in groups of fifteen, so in the training, this tradition is established and there you have experienced facilitators being there to support these groups. But once they leave the training, and they start working as a GP, mmm this facilitating stops and they have to look for their own peer review groups and what is often happening, is that they cluster together, and make ….they already know each other and they build a new group with those people who started in the same region at the same time. ... and sometimes those are the most interested and the most interesting groups and they do really nice things, but of older doctors, we really don't see that …that tradition (1).

I think peer review groups could be helpful in preventing burnout and finding on a local level way of cooperating to handle this problem of too much work ... even there if it is not supported or organised in a smart way from up, I think we will miss these chances (1).

…(embedding QCs in a system)…mmm ... organising during working time is one, ... training facilitators is another one, in a continuous way in and honouring in one or another way, maybe financially, especially for the extra hours and the extra work they put into it, and ... offering in the best way , offering GPs the possibility of easily gathering data of their own practice and being able to discuss that with their peers and colleagues would be the best if not, ... having in a much shorter time getting feedback on your practice from a national level and getting it in a systematic way ... brought into the peer review would be a good way (1).

It was the college that was in charge of the assessment to check the quality of the education because the Irish college of GPs has always been in control of …. of the quality and standards of education. But I think that is a good thing because I think that if your government spends money for an education system then it has to deliver what is relevant for a doctor working in primary cate at the moment. In the assessments, they try to see who is attending and how often and how big the groups should be what kind of educational material is covered and …. the three national workshops that we have and funded by the HSE executive we have the …. have to approve the programme and the teaching and how they deal with the groups (2).

The evaluation ..and usually there is a supportive evaluation so I'd have ..the year before that I had ... people that a group of doctors and you have two doctors who are familiar with this small group work and they come and visit an area and they'd sit in these groups and they talk how you can approve and it is mainly a support for the tutor I think because you have to look at what you are doing and you also get feedback from three people who are not usually attending your small group meetings. It is usually a very supportive structure and if they feel that it is something that is not appropriate or something you should change again, they actually there is an opportunity to do that as well. This is usually not seen as a negative process as far to my knowledge (2).

….. … so you know the evaluation is mainly to help the person who is organising; the evaluation is really for the tutor, because they are structuring and organising the meetings and it is really would be seen as a support process …really it… it ..unless there are big problems within that group and if there are big problems in that group you have the opportunity to discuss them with the team who is coming and actually very often you can actually clarify or solve problems that are occurring within the group. …..(interviewee moves through the room – inaudible) …and be quite supportive you know and most of us see this positive So but it is a lot of work when I had a team visiting me I had to write a report and have all the names of the GPs attending, I had to have the structure of the group clarified and show what curriculum we have covered the last number of years ... and discuss how the curriculum was selected and about the needs assessment and you also highlight how educational sessions are evaluated you do carry out evaluations on the teaching you are doing (2).

…. and now our association tried to talk with our minister of health and the director of health insurance about we want to …implement I quality indicators in our everyday work ….in our electronic medical records. so, we tried to talk about that…. but nobody really heard us. … And unfortunately, …. we have only support from the association of GPs and a little support from university, but from university every support was only words…it was not anything substantial (5).

… and then the next step will be … … talk with health insurance so they give us more money so we can buy some new equipment for our practices so we can work more quality oriented and that we can think about quality (5).

I think our problem is at the level of the organisational context. We don't get any support, we don't have protected time, we don't get any help to ... implement something new and do quality improvement from the government… administrative support does not exist. ….and we have too much to do …. too many patients a day (5).

the QCs have become important at the university like the seventh and eighth year at the university ... when we do the specialisation about the GP or family medicine… but this is not very usual or common it is not nationally organised (4.)

Establishing the group

'Sharing similar needs'

If the administration at the organisational level of QCs provides administrative support (i.e. training of facilitators, data gathering and provision of evidence-based information), protected time and space, CME points, and small financial incentives to QC participants (C), then they will meet in groups to exchange ideas (O) because QCs are the preferred learning style of GPs (M), support generates positive expectations among participants (M), and GPs think QC meetings with their peers will be useful (M).

…so obviously you get some CME credits you can use for accreditation (1)

…. some packets some information on a one topic or another in way so it can be used in QCs by the local people, often and this is working the best, is having someone who is coming with the information and carrying it into the QCs (1).

And I think that ... the other thing that is important to the group is the CME CPD points that they get and the funding from the government to attend meetings. That is all supporting the meetings as well (2).

...if you want to be recertified, every five years you have to document at least 20 hours in a QC (3).

'Need for relatedness'

If a steady group of members engages in socially enjoyable contact, led by a skilled facilitator who, e.g., introduces people to each other, opens discussions, clarifies and summarizes statements (C), then group members will get to know each other and decide on rules that they are willing to follow and so build a safe environment based on trust (O) because members want to be among and to interact with equals (M).

..this problem (no trust in the group because of competition about patient contacts) will be solved in a couple of years. When we started it was certainly that way but since about one in four is going to retire within the next five to ten years this will be solved and we get shortage of GPs and maybe that will make it easier for a peer review groups to have more trust and … and find each other to work together and to tackle new problems that may depend on shortage of GPs instead of too many (1).

…. it is the same, it is always the same 20 persons who are the member but once you will have 12 persons and the next time 6 will be the same but 6 will not have attended the last time and some come the next time again, so, the group is a fixed group, it is – of course, if you only have to participate twice a year, your group will not always be the same and it will vary a little bit, depending who is coming and who is not (1).

… but it became clear that we started to get to know each other and the sensibility of each other and to dare to tell about how we handle things and we learnt how to handle each other in a respectful way. Now we have to see how it continues (1).

I think ... the social aspect like you said you are right to discuss that because that is important. …. And I think that is an important part of the meetings (2).

And there is a rule in the group about honesty that if we discuss something that… that should stay in the group, it does not leave the group and that it stays in the group and I think that is respected because over the years there is much more honesty as the years go by (2).

We do have a meeting now I think in September or October where the doctors get together in a meeting in the afternoon and then we have a social gathering and for each of the group meetings we have coffee or tea and something to eat before the meeting this is important I think because a lot of doctors come for their surgery and they are tired they are fed up and they can have a cup of coffee and a bit of a (inaudible because she laughs) and they are going into the small group as a better doctor. the social aspect I think is very important…and we have half an hour with coffee and sandwich and then we start the meeting (2).

We have ... we would have done these rules in the very beginning when we started the groups, now we know each other for so long that there is no need to ... I think people are very respectful for each other and not necessarily to like each other because there people in the group who do not like each other and I think a norm like that would be difficult I think the rule is to be respectful and even if you don't like the person or agree with them that you are not disrespectful (2).

we usually start with what we call the round where everybody tells what case is on their minds buggering them or causing them problems and if some of them is very important ... we save some time for the end of the group (3).

I think the group make their own rules for conduct and in my group, we revise them quite often, so if we had some incident that was not so nice, we try to find better ways of behaviour towards each other and then the facilitator has quite a lot of authority, and if the facilitator is not able to exercise that, they can get help from four or five facilitator coordinators at the medical association. then they will come and help us in the group itself (3).

There should be like in many other countries ... at least the impression I get from for instance Sweden, the Netherlands, Australia, New Zealand, there is a lot of government support - but in Norway we actually do not have much at all. So, there should be much more understanding from the mostly national bureaus but also form the local authorities how important this is. There has not been enough understanding in the medical corps to ...h to do it and usually comes on top of all the other work and it is usually unpaid. So, we have to do it at night and during weekends (3).

...and we do that at dinner time so we can have some food together, we have dinner and we can enjoy food at the same time (4).

... I think if you know people a little bit you feel more comfortable ... to talk with if there are too many people who you never seen before and never talked to before, then it is difficult to open up and talk about (4).

this year ... we try to have kind of rules to be more organised in the group, so I think we try to keep it working, and ... I think that is the challenge, but we should think and have deeper reflection about what the real impact on our practice is (4).

'Need for autonomy and control'

If the group chooses its own topics and facilitator (C), then they will feel they own the QC (O) because this satisfies their need for autonomy, a feeling of being in control of one' s own behaviour (M).

And they discuss cases, and a topic is picked for the month and an education module occurs around a particular area the doctors bring patients they are looking after and there is a discussion about the cases and the topic area and it is facilitated either by the leader of the group or the tutor, the CME tutor in a particular area (2).

…the group decides to change the programme based on new things that are happening or changes in medicine that are happening and (inaudible) there is a general structure plan for the year but then it changes if something changes … if some group says they would like to cover this or that particular area, there are changes during the year. So, the programme adapts to the needs of the group (2).

…exactly big autonomy, the groups decide there is no pressure from the political system and there is no pressure from anybody and that is why this system is so successful – the doctors can choose (2).

No there's is a group leader (facilitator), and they are free to elect him or her, and they have to fill in one sheet of paper, where they have to tell date and time and theme and list of attendees (3).

'Size of the group affects communication'

If group size exceeds 15 (C), then interaction among group participants decreases (O) because participants cannot keep up with all of the other participants and follow their conversations (M).

…the group would be 10 to 12 people at the most and they would have a group leader or a tutor in the group that is the facilitator in the group and these groups would meet regularly every month and they would know each other because they meet eight times a year. Knowing and trusting each other is really important when doctors talk about their patients (2).

For instance, if … I think …15 people are too many …I think 8 is enough. and … the stress increases if there are more…. the smaller the group is the better the trust and talking (4)

'Variety of characters stimulates reflection – cognitive dissonance'

If members of the groups have individual character traits and describe differing professional experiences but accept each other's views (C), then they can learn from each other (O) because individual attitudes and behaviours will contrast with their peers' knowledge and cause cognitive dissonance that makes them reflect on their way of working (M).

I think it would be logical and ... more (better) with more diversity and ... with more like an enrichment (4).

…. because you can learn from (other) people with more experience, … … you have a (another) way of thinking and a (another) way of talking about stuff, situations, that are different I think, so I think it is about different knowledge (4)

'strong cognitive dissonance threatens self-image'

If individuals feel too strong a cognitive dissonance when integrating new knowledge (C), then they can disrupt group dynamics and the QC process halts (O) because this threatens their self-image and they feel at risk of losing their professional identity (M).

Yes, we do yea, we have doctors who are ... difficult in the group, yes, and they are difficult because they have very firm views and they spend very little evidence on reality. Then it is very important that you have good group leaders and leadership … It is very few … you know trying to sabotage the group…. and they don't tend to change behaviour (2).

it is more about personal reasons ……. one (participant) is really expansive and always talking about her and compares everything with herself, and she pretends to know the way …. we can't really … function and discuss as we wanted to, you know; it feels like competition … I don't know what happens … at that moment but …I don't think we have a good atmosphere then (4).

Learning environment

'Feeling safe and not vulnerable'

If participants trust each other (C), then they can describe how they work and admit what they don't know (O), because they feel safe rather than vulnerable (M).

... if they start any discussion, that is one of the problems, most of the time they just invite some external speaker a specialist or someone with a special interest to come and present something and afterwards they will have questions to speaker and perhaps discuss a little bit in between depending on the speaker and perhaps the facilitator if he really wants to facilitate but that is most of the time what is happening (1).

… (one of the important things) … is building the trust and building the trust…? I had a very nice compliment of one of my colleagues after wards which we have been working together …she told me you know one of the things I learnt from you one of the things I experienced from you is that mm opening up with difficult cases and showing that you don't know everything is showing that you are vulnerable and not knowing what do with it …you build up trust because if you dare doing this gives us the confidence that we also can do that … (1).

...one of my experiences but that we had in the practice last month I think it was that we took up the discussion about cases with the trainee and we realised by discussing cases that ... you often find gaps in your knowledge (1).

…and if people know each other within the group they are very honest and very open and they just ….and they discuss worries and concerns and there is a lot of that if the group is functioning well and everybody is feeling comfortable and there is a good level of trust in the group and they can talk about their cases (2).

…when a doctor gets upset, that has happened over my years and usually there is a kind of…within the meeting and they upset I would usually ... deal with that situation during the meeting and if they are upset and they are quiet and then I will actually go to them after the meeting but I will never let a doctor go home with issues that somebody got upset because the last thing I think a doctor should go through in small groups is ending up feeling upset or demoralised (2).

there is surprisingly ... huge openness and some people take it up and tell 'I have made a mistake and I ... feel bad about it' (3).

…we talk about cases we have social bonding; we are a group who feels safe, it is like a safe climate, we talk about ... our difficult situations (4).

We know each other very well, so I don't think anybody gets angry for this…and nobody …. gets emotionally the wrong way… if you understand what I mean (5).

'Need for competence and self-actualisation'

If the facilitator supports participants and encourages them to tell their stories and share their experiences in a safe environment, e.g., by encouraging interactive responses, through discussions and by summarizing statements, (C) then participants will be involved and share their positive experiences and failures (O), because they want to improve their competency, a sense of self-efficacy to achieve specific objectives (M), gain professional confidence (M) and achieve professional self-actualisation (M).

…having to share feelings of sometimes being powerless in certain situations was one of the things that built up the group the group feeling and which made everybody feel relieved, maybe not relieved but feeling confident and this is going to work (1).

There is no kind of structure that is imposed on the group and that makes the group actively by into the learning process because a lot of doctors bring information into the group and they bring learning from other places into the group that they have obtained so it is a very, it is a mix of learning from various places (2).

... and people will actually discuss for instance difficult moments in cancer treatment or cancer care, people will bring stories about patients but they will often bring problems about members in the family and the difficulties of being a GP and having to cope with this, and the major problems about being a GP, and that is very powerful stuff because that is about the personal aspect of being a doctor (2)

that is an 'after' discussion – I often call this the hidden curriculum because I think that is very important, I think that ... a lot of doctors over the years have been in distress and it is important to talk about this (2).

the truth is that if you are a doctor and if you want to do a good job then you have to make quality improvement and patient safety a part of your profession ... broader knowledge (3).

And ... I think you learn a lot of basic things you need in order to be a g good doctor for your patients, you learn respect, you learn to hold yourself back to be able to let the other people speak and the other to take … the front floor. Social control is quite important in many ways. … and you learn that much easier in a group than on your own (3).

...someone tells which was a typical situation for one of them, for one of us – sorry… and sometimes we choose…. for example, … we usually choose something that happened yesterday or the day before (4).

We prefer the clinical cases that we are difficult and where we have questions or bad emotions and … … we prefer that kind of a (difficult) decision because we ..... because first, for the person who explains the situation; and this is a good way to be or to get rid of the pain and talk about that and for the others it is always interesting because most of the time one of us had already been or experienced ... or felt that pain or talked about a situation that is similar. …it is like ahh mutual understanding and we can understand and talk about it with each other, and it is ... a good feeling if you see other people had the same and we understand each other (4).

…but it is much more it is about personal feelings and points of views in life or fear … or non-pleasant ... feelings or something with the people we have like difficult patients and our human relations with the patients, because no we don't have someone to summarise all the facts and all the feelings and ... there is no one who takes care of that what we do in the group (4).

I think it is important for psychological point of view not the feeling to be alone sharing your thoughts and experiences with friends and colleagues …. same GPs we have the same profession. I realise we are all in the same boat….it is also very stimulating to keep learning (4).

…and the fact that you can explain it to the others makes you realise that … you have a bit anxiety about it and all the others tell you that this ok – not just because they want to comfort you …then you realise that you became nervous about something very quick …even if you did something good after all….the group at this moment is very …….. a peaceful place and a good way of being with yourself and your own way of practising and it increases your self-esteem as well (4).

But sometimes it is about our problems … ..... our professional life…about our patient about some case ……diagnostics or prescriptions (5).

'Previous knowledge is activated'

If participants exchange case stories and experiences while actively listening to each other in the presence of a skilled facilitator in a safe environment (C), then they will share their knowledge by telling their own relevant stories (O) because the process activates knowledge they already possess (M).

well .in different way …. it can be telling about a case even analysing a critical incident, telling about critical incidents is important to us, that can be a discussion of a guideline, a ... that can be a well something new out of the literature, ... these are the ways we want to do it (1).

it does satisfy us when we can discuss about our own work and about our own cases, and we feel closer in the group when we stimulate each other's thinking (4)

When we talk about cases, case discussions, that is the most efficient part of the hour, because every participant wants to …… talk about and tell something about ... case ... about cases we experience. Sometimes, we have so different opinions and I f someone saw us from the outside, then …. they would think this is a crazy group…. but (laughs) but I think it is constructive…and we learn from each other because ... then, we talk about different aspects of the case (5).

‘Immediate relevance for the practice’

If QCs use the technique of experience-based learning (C), then knowledge becomes more relevant to GPs (O) because it relates to their everyday work and is therefore of immediate use (M).

...a lot of the doctors will start with a clinical case, but then come to an overview and then discussions and the next step is organising the GP surgery for that -it is quick wins (3).

I think sometimes we … we have ... it is more like an administrative part about the administration the administrative things about how to do the replacement of GPs, like all the papers and all the declaration stuff that is necessary for this ….it helps…. I think it is very helpful to talk about that (4).

We think about …when one participant tells a story… talks about the case and after that we talk about what we think ...everyone in turn…we have only women participating in the group (laughs) …. we say what we think is correct and we talk about what each one of us would do in this situation, what we think she could do better…we look if we can find some evidence about that (medical facts) … and we can use it right after (5).

‘Cognitive dissonance’

If participants discuss and reflect on their work processes (e.g., based on trustworthy data or personal experiences) during a professionally facilitated exchange of positive experiences or failures (C), then they discover knowledge gaps and identify learning needs and relevant topics (O) because their own attitudes and behaviours may differ from their peers’, creating cognitive dissonance that makes them reconsider their own way of working (M).

…. the government ...m is now offering ... the possibility but it is quite informal it is not on a massive level they offer the possibility to discuss ... some indicators on polypharmacy to be discussed with a ... an expert of the government and ..... then they offer the results of the QC and individual results to the people who are participating there and then they start a discussion about polypharmacy and that is existing (1).

…well if you tell a story we are doing this in this way in our practice, ... another practice could tell, well in our practice we see thigs differently and we do it another way and or it could be that … we help think about the situation with a difficult patient how you … you can handle it in a different way then somebody else will tell you, well, what do you think about that maybe this could be a way or this …have you considered this with this patient and ... perhaps you could take up and discuss with the patient how he feels about that ..... it is often gives you the opportunity when you get stuck with difficult patients and mmm to get new energy and to have …mmm to listen to the way other people would handle it can help to open up and take new initiatives instead of blocking and having the feeling that you don’t get any further with the patient (1).

…it is not just an easy push on one bottom but hard work ... on the other hand, we have a feedback from the government ... every two to three years which offers a lot of data about your prescription and about the population you treat and which you can use but that is always old data. We will now get one in the next months to come and that will contain data from 2015 it is now 2018!!! which will be analysed then so that is quite a problem (1).

Yes, Yes, prescription habits so ... ... prescription habits at the moment in Ireland is ... so if you are a public GP and you have a GMS number, then you get feedback on prescribing actually only in one area at the moment and that is benzodiazepines and you get that every year on benzodiazepines but you do not get feedback on anything else (2).

When for example a GP … in a gr ….group is saying that he does a particular thing that is purely not right not evidence based or in fact is wrong then the group are very good …I think because they know each other… they do not agree with the doctor but they actually discuss it in the group and a few other doctors say what they would do which is usually different and they usually say ' you may consider this as a different way of doing it because if you do it your way , this is what I find happens…' and there is never an issue where somebody needs to feel bad but they know that whatever they currently are doing is not what the other would (2).

I think because when you have had doctors I the group for a long, long time and working in practice for a long time I think you have to consider what people currently are doing and what they accept as appropriate for their practices or for their work. and I think to introduce new guidelines and new evidence you have to look at what people are currently doing and to get people to accept a change and see why this change would be necessary as well and sometimes the change is not necessary for the group; if you don't know whatever they are currently doing ,and if they are not exchanging ideas within the group then ..that really…they are not learning then because ... I think my criticism of guidelines and evidence is that they are not always practical to implement (2)

We use some data extraction software from the electronic health record so that every doctor gets his own indicators ... in a report that tailors the theme (3).

We usually do it (comparing each other's data) as a plenary thing and I can always say as a facilitator what about indicator 13 and then we go around the table what figures do you have and how would you explain them and the huge differences between the results. so, there is a …. a special part of data report of the indicator we go through in each meeting and we …when we have done that, they usually don't have use of the facilitator because the discussion is quite intense (3).

Firstly, I think they learn a lot about quality indicators and then you have to go into the matter why they differ so much. Why yours is so different from mine, and then you have to look at age spread of the population, my work, if I work a lot 'on call' for instance, which is different from sitting in the office all the time (3).

…yes, sometimes we choose difficult situations and sometimes we don't choose and we talk about the last situation we had the day before and sometimes like a simple disease that is not so difficult, so we talk about, because even if it seems to be easy we have different ways to do this and it is interesting to talk about even easy situations, because all the other do it in a different way (4).

We do have practice mirrors about hypertension, about diabetes and ... now we have some I work on some audit about prescription of warfarin, which gives a lot of interesting discussions (5).

… and I see only me ... is this ok or did do something wrong? but now we compared and compare two different practices in two different parts of Croatia and we have similar results, which surprised me (5).

We do that just like in case discussions; some of us have a little …presentation …we talk about guidelines or evidence-based information ….and we ahh we that …. colleagues talk about what they do in their practices and .... what she can do and why, …. giving the reasons…and after that we talk about …every participant talks about what she does in practice and what they don't do and the reason why they don' do it (5).

'Social learning'

If the facilitator uses purposeful didactic techniques (e.g., brainstorming, contentious or consensus discussions, or role play) to keep the group active and to reward exploratory behaviour during reflection on the work process (C), then the group will create a learning environment that promotes knowledge exchange (O) because learning is a cognitive process in which participants observe and imitate their peers' behaviour to gain social approval (M).

So I think that the more experienced GPs bring in their cases into the groups and they discuss their experiences within the groups and I think this is very powerful for the group and the younger GPs bring in …they have the latest evidence in their head and the guidelines and they bring it in ..and the mix of managing the patient with the evidence and the guidelines and the practical bit from the older GP who has the experience I think this is really the powerful bit in the group and … and this is where the learning really occurs (2).

…and I (Facilitator and tutor) don't have the arrogance to believe that they leave that meeting and go and change their practice but they are certainly aware of that their practice is not what the …. the rest of the group's is (2).

…case discussions are important so cases are a huge part of the group and the other thing we would sometimes do is ... a role play we also have used video consultation playing video cases or other reals life scenarios and the other thing we should use is discussion groups. So, you know like working groups for example I have twelve people and if I have something new, I might split the group into groups of four and so people would work within these smaller groups and then they carry their points of views back to the whole group. And it is not an individual but the whole small group who feeds back, it is the group it is a safer place (2).

yes, ... in the beginning we thought this (sharing data) had to be in pairs or triplets because we thought that people were not willing to share, but that was quite wrong. they love to share (3)!

…but we like to learn and understand how the others do; so, it is a learning from each other, yes that is what it is [in French] (4).

Adapting, creating and testing new knowledge

'Interdependence between health insurance companies/physician network organisations and GPs'

If physician network organisations require continuous QC activities (C), then QCs will negotiate priorities and design creative solutions(O) because the tension between autonomy and obligation spurs the group to act and negotiate together to reach a common goal (M).

It may be important for the emerging of QCs, that it becomes a mandatory thing (QI) and after all, we have the same goals (as the health insurance companies) (4).

We have as an obligation in contracts with our insurance to have .... peer groups..... then ... I don't know how many times we should meet, actually. But we don't have or get much money out of this (5).

'Threat to professional autonomy'

If GPs feel that the QC programme is only a top-down managerial intervention to reduce costs (C), then they will not be motivated and will not participate (O) because they feel unsafe and think they lack autonomy in their clinical role (M).

...no there are no demands, that wouldn't help, we have to do and there can be wishes how, but we decide....it wouldn't work otherwise (3).

'Interdependence among group members'

If participants maintain a trusting learning environment that promotes knowledge exchange, assisted by facilitators who use professional techniques (e.g., contentious discussion, reaching consensus, and role play), (C), then participants will adapt and generate new knowledge for local use (O) because they see themselves as being similar, and so act and negotiate cooperatively to achieve a common goal (M).

I think that a group ...cannot just be presented with things like here is the evidence, take it or leave it and goodbye and I don't think that works, I think that people need to ... participate and in the learning and they have to show what they are currently doing whether it is the correct thing or not; it needs to be discussed and adjusted and shared within the group (2).

'Identifying and removing barriers to change'

If participants, supported by skilled facilitators, address barriers to change (C), then they are more likely to implement the innovation (O), because participants help each other develop strategies to identify and overcome these barriers (M).

And I think you have to have guidelines that are workable for doctors who are you know seeing 30 to 40 people every day and if they want to implement change for the better they have to be feasible and practical and I think the only way to do that is to consider what they are currently doing. And what the barriers are to new care (2).

'Need for competence, autonomy and relatedness'

If participants create new knowledge and plan an implementation strategy (C), then they feel satisfaction, responsibility and stewardship (O), because this fulfils their need for competence (being able to achieve specific objectives) (M), autonomy (a feeling of being in control of their own behaviour) (M), and relatedness (a sense of connection to a larger group) (M).

No data but confirming comments.

'Intention to change'

If participants publicly announce their intention to change (C), then they are more likely to implement the change (O) because they and others in the group both think it is a good idea and believe they can carry it through (M).

…we ask the group to give a feedback on how they feel that would change them or their practice and the routine of care for their patients. So, they usually the group …we end the meetings with a feedback a summary and a feedback and a feedback from the group what it is they feel they want to change ... and I think that is the opportunity to …. not everybody participates in that…. but ... most people do ….and they'd say look this is what I learned this is new for me this is what I am ... going to change in my practice (2).

We talk about …how we shall we implement the guidelines and shall we implement this in our everyday process, what steps we can implement and how and what we cannot implement and why not……. … how do we need support from our hospital-based colleagues…? … in some steps of the implementation of the guidelines…. and ... sometimes we need help of our medical association because in … some steps when we talk about guidelines, we don't have the things (equipment) in our practice (5).

'Testing new knowledge'

If participants validate and test new knowledge in a QC, moderated by a skilled facilitator, in a safe environment (C), then they feel confident putting that knowledge to use in everyday practice (O) because they have had the opportunity to practise and familiarise themselves with the innovation (M).

..time to reflect on this practice is actually something that is very important and you have to figure out where the guidelines fit in and you reflect on what you are doing and the group and the process finds out the is correct the use of the guidelines and then for you as a practitioner you can look at that and see what practical that has changed over time and I think that the idea of a quality circle meeting is trying make changes dramatically is not practical I think doctors need to look at ideas and look at the practical parts to see what they can do and change slowly over time (2).

Repeating the process

'Gaining confidence in an innovation'

If the group repeatedly practices implementing and coping with an innovation (C), then they trust their own competence and turn the innovation into a habit (O) because successful outcomes increase confidence in their abilities (M).

... then we meet again after four months and usually the …their quality improvement project ... didn't really happen or just a little bit, and we discuss the reasons for that and how we could amend that etc. etc. (3).

…and ... yes and then we present it and I also present it wherever we work and at the practices where we work (4).

'Repetition priming and automaticity'

If participants build a steady group and practice using QI tools (C), then they will successfully implement new knowledge into everyday practice (O) because successful responses increase with repetition: 'practice makes perfect' (M).

...but it is really a double thing. it is about a theme but it is also about quality improvement. And the aim and goal are that they find it so rewarding that they use this this technique again and again. ……in their own surgeries and in their own groups (3).

Appendix Chapter Ten

Appendix 10.1 Preliminary study protocol

(Accepted 1st September 2020)

Pilot Intervention to implement shared decision making for guidelines-recommended antibiotics prescription in Swiss family physician practices

Pilot Intervention to implement shared decision making for guidelines-recommended antibiotics prescription in Swiss family physician practices

Sponsor/Sponsor-Investigator Adrian Rohrbasser, Adjunct Researcher, Institute of Primary Health Care (BIHAM) and Head of Quality Improvement, medbase

Study Title: Pilot intervention to implement participatory medicine for guideline-recommended antibiotic prescriptions in primary healthcare physician practices in Switzerland

Short Title/Study ID: Antibiotic prescription in primary healthcare practices

Background and Rationale: Antibiotic resistance is a well-documented threat to our public health. Reducing antibiotic prescription in primary healthcare can effectively reduce the rate of antibiotic resistance (3-6).

Primary healthcare physicians (PCPs) in Switzerland prescribe antibiotics more fastidiously than PCPs in other countries (8-10). However, they still overtreat some common infectious diseases. Providing them with guidelines and physician-performance feedback might be insufficient to effectively reduce antibiotic prescriptions (18). Innovative and effective solutions do exist and have been tested in other countries. One of these is that PCPs involve patients in the decision-making process when prescribing antibiotics (11-12). Indeed, some PCPs might be fully aware of the need to reduce prescription rates, but patients have expectations of receiving a prescription, while other PCPs may overestimate the effectiveness of antibiotics or underestimate their incidence of adverse events. In order to involve patients in antibiotic prescription decisions, PCPs

first need to gain knowledge about their true effectiveness as to improvements of health outcomes or as to possible dangers associated with the treatment. Simple charts have been shown to improve PCP understanding of the true risk, thereby reducing the level of medication and diagnostic testing. Second, patients need to be able to understand these risks and be invited to participate in the decisions. Third, PCPs need to gain greater self-conviction when involving patients in antibiotic prescription by accommodating their values and preferences (13).

PCPs currently lack tools, such as patient decision aids (PDAs), that enable them to make decisions together with their patients. The experts who develop these PDAs should not have any financial interests and should implement them in a process of repetition in collaboration with PCPs and their patients. PCPs also need specific training in the use of PDAs and to hone their communication skills to better engage their patients in shared decision-making. In particular, PCPs need to trust their own competence when they discuss the option of not prescribing antibiotics. A training session with a PDA in primary healthcare quality circles may increase PCP's knowledge, enhance their communication skills and help them use this shared decision-making tool when prescribing antibiotics, thus implementing the guideline (19-22). Involving PCPs directly in the development of PDAs might also ensure the subsequent implementation and circulation of these tools in the Swiss healthcare system.

We plan to adapt and develop PDAs using participatory methods with PCPs and patients. These PDAs should increase PCP and patient knowledge about the risks and dangers of antibiotics, and facilitate shared decision making when they face the choice between prescribing or not prescribing antibiotics. We will follow evidence-based methods for the generation of these PDAs, as with other PDAs developed by our group, covering topics such as cancer screening and counselling for smoking cessation.

We then plan to integrate these PDAs into a quality circle training session for PCPs and test whether we can increase both their knowledge of the risks and dangers of prescribing antibiotics and their confidence in not prescribing them.

To develop and test our PDAs, we will conduct a pilot study in two quality circles of six to twelve PCPs. Quality circles are a multifaceted, step-based intervention for quality improvement in primary healthcare that have gained international traction because they may foster long-lasting behaviour change (14). PCP quality circles are well established in Austria, Belgium, Denmark, Germany, Ireland, the Netherlands, Norway, Sweden, Switzerland and Scotland (17). In Switzerland, 80% of all PCPs regularly take part in quality circles (16).

Objective(s): Overall objectives:

1. We aim to improve the current practices of PCPs in Switzerland when diagnosing and treating common conditions currently overtreated with antibiotic prescriptions (acute otitis media, acute cystitis in women and acute tonsillopharyngitis).

2. To adapt, develop and test PDAs for common conditions currently overtreated with antibiotic prescriptions (as above).

3. To develop educational material on prescribing or non-prescribing of antibiotics to change PCP attitudes and ideas when diagnosing and treating patients for common conditions currently overtreated with antibiotic prescriptions (as above).

4. To evaluate the effect of the PDA on how PCPs approach common conditions currently overtreated with antibiotic prescriptions (as above).

- Increase in knowledge about the risks and benefits of antibiotics
- Change of attitude and intention towards prescription of antibiotics

5. observe the spread of the educational module among Swiss QC

Outcome (if applicable, see basic form):

Primary outcome

Secondary outcome 1) Increase in PCP knowledge about:

a) absolute risk of bacterial causes as the cause of symptoms

b) absolute benefit of antibiotic treatment

c) absolute risk of antibiotic treatment

for common conditions currently overtreated with antibiotic prescriptions (as above).

2) Change of attitude towards diagnostic and prescription practices with regard to common conditions currently overtreated with antibiotic prescriptions (as above).

3) Use of PDAs for common conditions currently overtreated with antibiotic prescriptions (as above).

4) Use of further educational material on antibiotic prescriptions for currently overtreated conditions (as above).

5) Spread of the training material to further QCs

Study Design, Measurements and Procedures:

We will develop educational material and adapt existing decision aids to the Swiss health context if available, or develop PDAs on the three diagnoses of: acute otitis media, acute cystitis in women and acute tonsillopharyngitis. We will use a participatory approach with multiple testing and rounds of adaptation. A group of researchers, experts and PCPs will develop an initial version and let the members of a quality circle and their patients test it. After a round of adaptation, the members of the quality circle will retest it. We will take baseline measurements on existing knowledge and attitudes towards treating these conditions and measure them again after three meetings to compare them with the baseline measurements.

Recruitment of two quality circles that voluntarily participate in our trial:

First meeting and baseline measurement

Intervention:

- Blind questionnaire on the rate of bacterial cause of the symptoms, the absolute benefits and absolute dangers of antibiotic prescriptions for patients presenting with otitis media, cystitis and tonsillopharyngitis.

The blind questionnaire will use clinical depictions illustrating the typical treatment (substance, dosage, application method, length of treatment, additional recommendations) and the difficult balance between the benefits and dangers of antibiotic treatment for the specific infection. The questionnaire will work as a baseline measure of knowledge, attitude and intention.

- Answering of the questionnaire with discussion.
- Circulation of guidelines on the prescribing or non-prescribing of antibiotics and their possible consequences.
- Presentation of draft decision aids.
- Presentation of communication techniques when using PDAs.
- Discussion with feedback on the PDAs and possible concerns in using these in routine clinical practice.

Adaptation of the decision aid and information material by the researchers, based on feedback from first quality circle meeting.

Second meeting after two months:

- Presentation of the adapted PDAs and information material and discussion on the possibility of using them.
- Feed-back from participants on further necessary improvements so PCPs can use PDAs in clinical practice.
- Training in shared decision-making with a patient using the decision aid.

Potential for adaptation of the decision aid and information material based on feedback from second quality circle meeting by the researchers.

Third meeting after 4 months

- Feedback on interventions and PDAs based on experiences in the group. Collection of possible improvements to the intervention or decision aid.
- Discussion of data gathered by PCPs during clinical encounters.
- Discussion of pros and cons on possible data sheets and their content to assess the use of decision aids and communication material for patients.

Outcomes collected at third quality circle meeting

- PCPs will answer the questionnaire once more (clinical depictions that were used during baseline measurement). We will re-evaluate their knowledge of the risk and danger ratios, and their attitude toward treating the patients in the clinical depictions with antibiotic prescriptions.

We will document any feedback to improve the PDAs and analyse any problems that may arise when reducing the rate of antibiotic prescription.

The intervention is scheduled to start in late summer 2020 continuing through the winter to include the various infection seasons.

Observation and counting the number of QCs that use the intervention after the study period

Number of Participants with Rationale (if no Power Analysis conducted): Between 12 and 24 PCPs (2 QCs)

Study Duration:12 months

Study Schedule: 10/2020 - 10/2021