Promises and perils of group clinics for young people living with diabetes: a realist review

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Abstract

Group clinics are becoming popular as a new care model in diabetes care. This evidence synthesis, using realist review methodology, examined the role of group clinics in meeting the complex needs of young people living with diabetes. Following RAMESES (Realist And Meta-narrative Evidence Synthesis) quality standards, we conducted a systematic search across 10 databases. 131 articles met inclusion criteria and were analysed to develop theoretically-informed explanations of how and why group clinics could work (or not) for young people with diabetes.

Models of group-based care in the literature varied significantly and incorporated different degrees of clinical and educational content. Our analysis identified four over-arching principles that can be applied in different contexts to drive sustained engagement of young people in group clinics principles: [a] emphasising self-management as practical knowledge; [b] developing a sense of affinity between patients; [c] providing safe, developmentally-appropriate care; and [d] balancing group and individual needs. Implementation of group clinics was not always straightforward; numerous adjustments to operational and clinical processes were required to establish and deliver high-quality care.

Group clinics for young people with diabetes offer potential to complement individualised care but are not a panacea and may generate as well as solve problems.

Introduction

The global rise in diabetes prevalence is expected to have serious consequences across healthcare systems. It is estimated that by 2045, healthcare expenditure on diabetes will reach USD 776 billion (1). In the UK the cost of diabetes care is expected to account for 17% of the total health resource expenditure in 2035⁄2036 (2). A large proportion of these costs relates to managing diabetes complications, such as retinopathy, neuropathy, diabetic foot and cardiovascular disease, which lead to reduced quality of life and premature mortality (1). Alternative approaches to care provision are necessary to stem what has been described as a 'titanic struggle' against the burgeoning personal and systemic impact of diabetes (3).

Group clinics (also known as shared medical appointments) involve delivery of care provided to groups of individuals at the same time, rather than one-to-one interactions with health professionals (4, 5). They have been proposed as a way to address rising healthcare costs and diminishing resources, with the potential to improve efficiency and to provide opportunities for peer support and social learning (6). Group clinics can be delivered in a variety of formats and have been targeted at different patient populations (4, 5).

In diabetes, experimental studies of group-based care for adults have shown improvements in glycaemic control, problem-solving ability and quality of life and reduced time commitment for clinicians, compared to standard one-to-one consultations (7). Similarly, systematic reviews of group care for diabetes highlight clinical benefits (lower HbA1c, blood pressure) and improvement in patient-reported outcomes (4). In a randomised trial, a group-based story-sharing intervention for minority ethnic groups was associated with higher attendance and patient enablement scores, compared to structured self-management education, when both arms also included standard one-to-one clinical care (8).

Diabetes prevalence (type 1 and 2) is rising in young people (9), and is associated with emergency hospital admissions for diabetes-related emergencies (10); inadequate

preconception care and adverse pregnancy outcome (11). Clinical outcomes in young people with diabetes are strongly influenced by health inequalities (10). Recognised barriers to regular clinic attendance and engagement for young people include diabetes-related psychological distress, lack of care continuity, poor satisfaction with the health service, lack of developmentally appropriate consultations and fear of complications (12, 13). Patterns of poor engagement with health services in adolescence and young adulthood often persist into adult life (14). Novel approaches to care delivery are therefore urgently needed to address the specific health and self-care needs of young people with diabetes.

In this paper we use a realist approach to synthesise current evidence on group clinics for young people with diabetes. A realist review allows us to extend beyond de-contextualised lists of barriers and facilitators to understand 'how, why, for whom and in what circumstances' group clinics might work for this age group and to draw on interdisciplinary literature and relevant knowledge from studies in other age groups, using a systematic process (15). This approach follows the tradition of narrative reviews that aim to increase understanding, rather than summarise data (16). We build on previous evidence of clinical benefit to understand how group clinics need to be implemented in practice so these benefits can be realised for different types of patients and in different circumstances. The realist review underpins a theoretical and participatory approach to the co-design and evaluation of group clinics as part of the TOGETHER study, a wider interdisciplinary programme of work testing feasibility and implementation of group clinics for young people living with diabetes (for more details see 17).

Aims

This review aims to explore how, why, for whom and in what circumstances group clinics may be able to support (or why they may not support) young people living with type 1 and 2 diabetes. The review questions below seek to gain a nuanced understanding of how young

people respond to group clinics and what aspects of the context are important in generating different outcomes.

Review questions

1. How (that is, by what mechanisms) might group clinics meet the complex health and social needs of young people living with diabetes?
2. In what way(s) might context influence key outcomes of group clinics in this population?
3. In what circumstances, if any, are group clinics likely to provide a better way of supporting diabetes self-management than traditional care?

Methods

Our methods are based on previous realist reviews and on the Realist And Meta-narrative Evidence Syntheses: Evolving Standards (RAMESES) (15, 18).

Data sources and searches

We performed literature searches in Embase (OvidSP), MEDLINE (OvidSP), PsycINFO (OvidSP), Web of Science Core Collection, ASSIA (Proquest), Cinahl (EBSCOHost) Cochrane Database of Systematic Reviews (Cochrane Library), Cochrane Central Register of Controlled Trials (Cochrane Library) and Dissertations & Theses Global (Proquest). An information specialist devised and tested the search strategy based on previous systematic reviews (see Appendix 2 for an example of the search strategy) (19).

Study selection

Following two rounds of screening (title/abstract and full-text) by one reviewer (CP), articles meeting inclusion criteria were classified as core (i.e. on group clinics primarily focusing on 16-25 year olds), highly relevant (e.g. on group education for 16-25 year olds or similar age groups, perspectives and systematic reviews on group clinics) and less relevant (e.g. group visits or education in very different age groups, studies on transition and young people's experiences living with diabetes, general systematic reviews on diabetes) – based on their potential to contribute to our understanding of group clinics for young people with diabetes. A 10% random sub-sample of papers was reviewed by two additional reviewers with different expertise (GC, AH) to ensure consistency.

As per RAMESES standards, inclusion and exclusion criteria were refined as screening progressed (15, 18). Studies published in English from 1999 were included if they focused on any of the following topics: group-based care (in any setting) for young people (aged 16-25) with diabetes, other group-based processes such as group education, and qualitative experiences of young patients living with diabetes and transition to adult services. Studies were excluded when they described one-to-one interventions or educational programmes without a component of group interaction, when they referred to patient groups radically different to young people (e.g. much younger children or older adults), when they only discussed in-patient or home-based education, when they had a very specific focus (e.g. exercise programmes or family planning), or when they described low-resourced healthcare systems.

Data extraction and quality assessment

One reviewer (CP) read all articles included following full-text screening and conceptually coded relevant data using the qualitative data management software NVivo 11 (QSR International) until theoretical saturation was reached. A 10% random sub-sample of coded

articles was reviewed by a second reviewer (GC) for consistency and disagreements were solved by discussion. At the point of inclusion based on relevance, the trustworthiness and rigour of each study was assessed as appropriate for different study designs (15). Descriptive study characteristics are presented in Appendix 3.

Data analysis and synthesis

Following a preliminary phase of conceptual coding (in which we sorted findings into broad sets of ideas and explanations provided primary studies), we then applied a realist logic of analysis. We began with a preliminary programme theory, that is, an initial set of assumptions or statements about how group clinics function to deliver outcomes. We drew on qualitative and quantitative data from included studies to progressively refine this programme theory. Realist analysis assumes that programmes do not have uniform effects, but trigger different responses depending on particular contextual factors, thus leading to different outcomes in different studies even when the intervention is similar. This detailed study-by-study analysis generated context-mechanism-outcome configurations (CMOCs), i.e. refined statements on how different mechanisms (or responses) are triggered under specific contexts to produce outcomes (also see Glossary in Appendix 1). In non-specialist language, CMOCs are proposals about "what works for whom, under what circumstances and why?".

By using successive primary studies to add detail and nuance to an emerging programme theory, we were able to refine our explanations of why certain patterns seemed to be occurring under specific contexts. A key focus of the explanation was the question "how do young people with diabetes interpret and respond to the resources (human and material) offered by group-based care and in what kind of circumstances are positive responses likely to be triggered?". In undertaking the review, we followed a configurational rather than an aggregative approach

– this means we were not trying to add up data to generate an effect size, but to reach a nuanced explanation of why any effect size of group clinics is likely to vary. Additional methodological guidance for realist reviews is available in the RAMESES training materials (15).

The review questions required us to incorporate theorisations of chronic care, notably those of self-management of chronic conditions (20, 21); theories of how practical patient knowledge can be made useful and transferable (22); theories of how care delivery requires subtle adaptations and ongoing co-ordination (23); and psychosocial theories of how individual behaviour and perception is influenced by the wider social context (24, 25). These theories provided a sensitising lens throughout the analysis of the literature. Findings also refer to diffusion of innovations and self-efficacy theory to illustrate specific aspects (26, 27). The final output of the review is a set of four overarching principles for the development of group-based care for young people with diabetes.

Stakeholder input

The programme theory was refined through discussion with young people living with diabetes, health professionals and wider stakeholders (e.g. policy makers), as part of a wider research programme that uses the findings of this realist review and a participatory co-design process to build a new group-based model of care (17).

Findings

Search results

The flowchart for the review is shown in Figure 1. Of 1641 records identified on the original search, 39 empirical studies were highly relevant to developing our programme theory and 72

contributed additional insights; a further 19 primary studies were subsequently added. Of these 131 studies, 32 used quantitative, 29 qualitative and 12 mixed methods. There were also 2 books, 45 reviews, 6 position papers and 5 papers describing frameworks or models of group-based care interventions.

[Figure 1 here]

Distinct literature on group clinics for young people with diabetes was sparse, but studies of group-based structured education and group clinics in a wider age group offered additional sources of data, along with work on young people's experiences living with the condition and on transitional care. Group clinics were described differently: as shared medical appointments, group medical visits, cluster visits, and drop-in groups. Some papers described group care for young people that involved a clinical component (e.g. 28, 29, 30), but in most cases group interactions were discussed only as part of educational programmes (e.g. 31), or as a component of larger multifaceted interventions (e.g. 32). We analysed articles on diabetes type 1 and 2 jointly as the issues arising in group formation and engagement where similar and related more to the age group, rather than the type of diabetes. Papers describing intervention studies provided little detail on how group-based care was set up and delivered within existing services.

Group clinics for young people with diabetes: how, why, for whom and in what circumstances?

In our analysis we identified four over-arching principles by which to consider how group clinics could be designed and delivered to support young people with diabetes: emphasising self-management as practical knowledge; developing a sense of affinity between patients in groups; providing safe, developmentally-appropriate care; and balancing group needs with individual priorities (illustrated in Figure 2). Below we discuss each principle in turn, and

present the CMO configurations resulting from our realist analysis underpinning these principles. The detailed CMO configurations are included in Appendix 4 along with illustrative quotes from the literature. The findings below also present an analysis of critical factors affecting the practical implementation of group clinics within health services arising from our review.

[Figure 2 here]

Principle 1: Emphasising self-management as practical knowledge

Group clinics play a symbolic role in recognising the significance of patient expertise and supportive peer relationships. This shift towards shared care in collective settings is generally well received by younger patients, who report high levels of satisfaction (29, 30, 32). Sharing experiences of diabetes self-management between peers may lead to perceptions of increased understanding and learning (CMOC 1) (e.g. 28, 29-31, 33). Real personal experiences help contextualise abstract medical advice which can lead to better self-management (28, 33, 34). Facilitating opportunities for the exchange of tacit, practical knowledge between patients in group-based care becomes important (34), especially when there are young patients with different levels of experience in independently managing their condition.

Young people who feel isolated or negative about their self-management, and those with diabetes distress may draw encouragement from peer support in group interactions, subsequently leading to more confidence and motivation (CMOC 2) (e.g. 28, 31, 33, 35). This is often assumed to result from role-modelling by patients who present themselves as more successful (35). The literature commonly highlights empowerment as a way to explain how group clinics and other peer interactions contribute to behaviour change . However, emphasis

on individual behaviour change and self-management may neglect the social, professional and cultural contexts in which patients are embedded.

Group clinics are assumed to provide a space for experimentation and reassurance – when a behaviour is normalised in the group, it might become easier to perform it in public (36). Especially for those experiencing their diagnosis and self-management as stigmatising, peer support in group clinics may help instil a sense of normalcy, which could lead to re-thinking self-monitoring and management in social settings (CMOC 3) (e.g. 19, 31, 36, 37, 38).

Principle 2: Developing a sense of affinity between participants in group clinics

For group clinics to work, the literature suggests a need to instil a sense of connection and affiliation between participants, and that this is most likely to develop when group participants are invited on the basis of common characteristics or shared experiences so that patients can relate to each other (CMOC 4) (e.g. 28, 39, 40). This is reinforced in a previous realist review which suggests there is an *'implied need for homogeneity within the group in order to harness shared norms and values'* (37). What homogeneity means for young people living with diabetes is less clear. 'Homophily' – i.e. the degree to which people perceive others to be similar to them – may be a more suitable concept to underpin an analysis of group influence, as described in diffusion of innovations theory (27).

In the literature reviewed, developmental stage, time since diagnosis, life stage (e.g. moving to university) or treatment options (e.g. pump therapy) are assumed to be important in allowing young people to interact more easily (40). There is, however, little data to show which of these characteristics may actually make a difference in practice. Group homogeneity or homophily does not just relate to creating a sense of affinity based on pre-existing characteristics, but also to ensuring that topics of interest to all participants are discussed in the group (28).

Diffusion of innovations theory also highlights that ideas may flow less readily within a social system when there are too many similarities between people, therefore 'heterophily' becomes equally important (27). In practice it may be difficult to match participants based on background so building a sense of affinity will depend on how discussions are facilitated to foreground commonalities and build on differences (5). Knowing patients well enough to be able to understand how they might fit (or not) into a specific (albeit diverse) group and fostering interactions in ways that not only focus on shared experiences but also help reconcile contradictions may help young people feel affinity with others (41).

Principle 3: Providing safe, developmentally appropriate care

The literature acknowledges that young people are going through a life stage where they are experimenting with their identities in-between childhood, adolescence and adulthood, testing boundaries and keeping their options open (41, 42). Although necessary for their development, this experimentation often '*become[s] labelled as problematic [and] problem saturated stereotypes of young people are allowed to dominate'* (38). Young people living with diabetes may have specific vulnerabilities in addition to their diabetes, including eating disorders and mental health difficulties, lack of supportive relationships, and perceptions of low self-efficacy (42). In a healthcare system that values consistency, attendance and adherence, adapting services for young people needs to be an ongoing and flexible process, and should recognise the physical, cognitive, symbolic and socio-emotional work involved in self-management (43).

Bringing people together in a way that allows connection and affinity requires significant skills and in-depth relational knowledge of patients and their circumstances. The literature suggests that successful group clinics emerge from good pre-existing relationships between patients and clinicians (41, 42, 44). Young people feel they can trust their clinician, who knows them well enough to suggest group clinics as a way to benefit their own individual circumstances and to

bring them together with other people who can share valuable expertise. This relational introduction could also counteract patient fears that group clinics are purely used as a cost-cutting measure.

When young people have a good relationship with their clinicians and perceive service provision to be collaborative, helpful, respectful and characterised by mutual understanding, it is more likely they will feel safe in exposing vulnerabilities and they will perceive added value from their interactions with services providers. In turn, this may lead to increased engagement with the service and increased attendance (CMOC 5) (e.g. 41, 42, 44).

Service providers are commonly advised to deliver young adult care in an age- and developmentally-appropriate manner, using a confidential and non-judgmental manner (42); '*empathic, non-confrontational'* interventions and careful use of language (42); and emphasising emotional and motivational needs (35). Studies also recognise that young people may prioritise short-term gain over long-term implications and may respond more positively when care extends beyond biomedical aspects of living with diabetes to include young people's personal and professional priorities (41, 44).

Group clinics have the potential to support developmentally-appropriate care, creating a safe space for discovering what it means to be living with diabetes, through one's own experiences and through the experiences of peers. Emphasis on positive aspects of self-management, such as how young people can achieve dietary freedom or better manage their exercise regime, is also deemed important in building confidence, self-esteem and optimism (CMOC 6) (e.g. 45). Participation, however, needs to be treated as a dynamic process and priorities need to be continuously reassessed and negotiated to maximise the potential for continued engagement.

Other questions arise in group clinics for age groups <19 years; literature suggests parents are active participants who attend the majority of group clinic appointments, and whose presence

increases discussion of significant diabetes-related topics (30). There are concerns, however, as to whether having parents in the group clinic may lead young patients to take a more passive stance (46). Some interventions include separate parent-only groups to allow ongoing parental involvement where needed, while still allowing space for young people to share with their peers (28, 38). A combined approach may also help manage family relationships without detracting from the value of a peer-based model (38, 45).

Evidence on the potential of group clinics to support people to ask questions is contradicting: some patients feel more comfortable contributing questions, while others are more reserved in a group context (29, 30). Although 'legitimate peripheral participation' is considered important in the process of social learning and community building (47), its consequences need to be managed carefully in short-term interactions. This mismatch of expectations about participation in the discussion may lead young people who contribute more to feel they cannot rely on their peers and may have negative consequences on group formation and engagement.

Some studies suggest that young people in most need (e.g. those with the highest HbA1c, low self-esteem, or more signs of diabetes-related distress) are less likely to engage with diabetes services, whether individual- or group-based (32, 44). For young people who have negative perceptions about their ability to self-manage or who face diabetes-related distress, fear they may be diagnosed with complications or that they will be judged by fellow patients, may lead to further disengagement (CMOC 7) (e.g. 32, 44). From the perspective of self-efficacy theory (26), disengagement could be seen as a coping mechanism against young people's lack of confidence in their own ability to deal with self-management challenges. Group clinics may play a significant role in allowing young people to increase their self-confidence by observing and learning from others who have been successful through sustained effort.

Group clinics may also have other unintended consequences for young people, for example normalising risky behaviours, sharing negative experiences detrimental to diabetes care, or

reacting adversely to advice given by figures of authority. Managing these group dynamics is important to avoid negative outcomes (48).

Principle 4: Balancing the needs of groups and individuals

Group interactions allow clinicians to acquire a sense of how young people interact with peers in the context of self-management and to identify patients' emotional and motivational needs (35). This provides opportunities to address issues that remained unarticulated in individual consultations. According to the literature, it is often individual attention as part of group-based care that leads to improvement and satisfaction. However, if patients feel their individual needs are not fulfilled to the extent needed and in a timely manner then group clinics may not be sustainable (49). With time, people who engage in group sessions, make continuous judgments about the added value of these sessions to their own individual needs, which leads them to decide whether they will keep engaging with the group (CMOC 8) (e.g. 28, 30, 36, 37, 49). Existing literature indicates wide variability in group attendance, with interest dissipating as patient needs and circumstances change (28, 30, 36, 37, 39, 49).

Therefore, group clinics need to ensure expectations are managed and individual needs are adequately attended to, rather than focusing on a collective approach alone. This generates questions about the potential for group clinics to replace individual appointments (30, 36, 37, 49). Given the lack of long-term studies, it remains unclear whether engagement in group clinics translates to improved glycaemic control or perceived quality of life for young people, especially for those transitioning to adult care (29, 36).

Delivering group clinics: practicalities and hidden implementation work

Our review identified a number of additional areas for consideration when designing group-based care. Given the literature is not yet well developed around these issues, we have not configured them as CMOCs but present them in a descriptive synthesis, to highlight their importance and the need for further study.

Running group-based care in healthcare services traditionally designed to deliver one-to-one consultations is often described as challenging. Established infrastructure and administrative processes have to be adjusted to fit the new approach, while continuing to support individualised care. This requires significant effort and introduces additional workload, which some studies suggest balances out any time efficiencies gained through group-based care (39). Despite best efforts to coordinate group clinics and ensure good group composition, non-attendance, late cancellation and participation attrition are common and result in resource waste (39).

Practical constraints to group-based clinics are widely reported, such as lack of suitable space to accommodate groups and need to use external facilities (33, 45). 'Hidden' operational work is necessary to ensure clinics are set up appropriately, with health professionals briefed, content planned, and attendance confirmed, among other tasks (5). 'Hidden' clinical work is also required as clinicians will need to 'triage' for patients requiring further individual attention in the context of the group interactions (37).

Delivery of group clinics require a wider skill set, different from individual clinical consultations. Groups need to be led by someone in a facilitator role who can engage patients in discussion and manage group dynamics to allow experiences to be shared, to ensure patient needs are met either as part of the clinic or individually; to resolve any contradictions or disagreements with sensitivity; and to sustain a pleasant, positive and safe learning

environment (31, 33, 37, 40). These skills expose additional training needs that need to be fulfilled for staff to be able to deliver group clinics for young people (41, 42).

Discussion

Summary of findings and comparison with previous literature

The 4 key principles arising from our realist review, and the 8 CMOCs that underpin them, synthesise a broad range of interdisciplinary literature and allow us to explore the mechanisms by which group clinics might meet the needs of young people living with diabetes, the contexts in which this might work, and the circumstances in which this is likely to add value over traditional care models.

Previous studies on group-based care have demonstrated improvements in glycaemic control, self-care and problem-solving ability, self-efficacy and quality of life, along with reduced time commitment for clinicians (4,5,9,10). There are mixed results in relation to costs, emergency attendances and hospital admissions (5). Although it is well established that group clinics could contribute positively to patient care, less attention has been paid to how these benefits could be achieved consistently and for different patient groups (e.g. young people who face significant challenges with engagement), or what their wider social impact might be (e.g. on education and employment.

In line with other reviews on group-based care, we highlight the important role of therapeutic relationships in the care of young people with diabetes, not just between doctors and patients, but also between peers (37). However, peer support does not emerge automatically in group interactions, but occurs as a result of carefully crafted interventions. In-depth knowledge of patients' circumstances and good pre-existing relationships with clinicians allow attention to

wider aspects of coping with diabetes, rather than focusing solely on self-management as an individual behaviour (25).

Despite policy interest in group clinics as a replacement for one-to-one consultations (50), our review reinforces that individual attention should be equally valued and prioritised. Group clinics seem to work only on the basis of addressing individual patient needs – either by bringing together groups homogeneous enough to be able to discuss issues of common interest or by addressing individual needs outside the group clinics. There is little evidence to suggest that full replacement of individualised care with group clinics would lead to positive experiences for young people, suggesting a care model that combines both may be optimal and is worthy of further study. Booth et al suggest that group clinics may be more successful for specific period of times to fulfill clearly identified needs, rather than as a long-term solution for patient care (37). More work is needed in this area to investigate the right balance between one-to-one and group-based care specifically for young people with diabetes.

Group clinics become sites for collectively framing, normalising or contesting different types of biomedical and patient knowledge (22, 34). This process of '*knowing together'* evolves as people compare their experiences and translate clinical knowledge, for example by discussing devices used to support self-management (22). Other studies have discussed this process as 'vicarious learning' or 'learning by doing', but have not considered the influence of the group on developing an identity as an adult patient living with diabetes (19, 37).

For young people who have recently arrived at a stage of independence in their diabetes self-management, group clinics also act as a platform for collectively developing values and norms about what it means to attend adult diabetes care. In the existing literature there is more emphasis on group clinics modeling a notion of patients as empowered, in that they can responsibly and proactively negotiate their care (and fulfill their individual needs) in the

context of a group interaction. This only draws attention to specific dimensions of patient-hood and may require careful management to ensure young people are benefiting.

Group clinics constitute a completely different way of organising care and with this comes different requirements for operational and administrative resources, space for consultations, facilitation skills, documentation systems, as well as time investment in getting to know patients and bringing them together in groups meaningfully. This includes careful co-ordination between health professionals and appropriate individual management of patients who seem to require extra attention. It is easy to underestimate the effort required in setting up and delivering good care through group clinics, because it remains unarticulated and hidden.

Lessons learned

Group clinics have been studied across a range of conditions but have received less attention in the context of diabetes care for young people, despite the urgent need for better care models to improve the poor health outcomes in this patient group.

Involvement in group clinics on the basis of good pre-existing relationships with health professionals seems to be key in retaining young people's engagement with the service. Carefully crafted therapeutic relationships between patients and health professionals are based on flexibility, openness, non-judgmental language and understanding of developmental goals and competing priorities. Group composition and facilitation relies on good knowledge about patients – not just clinical information, but relational knowledge about their personality, motivations and social context.

There are significant challenges to implementation and substantive work is required to establish successful group clinics for young people. Resource implications, impact on pre-existing processes, additional skills and infrastructure requirements would need to be evaluated and costed. Iterative co-design of group-based care may help towards a clear value statement for

patients that would enhance the perceived usefulness of the model and would lead to sustained engagement and sustainability.

Strengths and limitations

This review fulfills a specific need in generating actionable evidence on how and why group clinics may work for young people living with diabetes. To do this we are drawing our interpretations on a wider range of data than previous realist reviews, which looked across conditions or focused only on a small number of studies. Although this has significantly expanded the evidence base feeding into this review, many of our interpretations derive from literature on group-based education and would need to be examined further. Under-reporting of the content and delivery of interventions (for example, how group clinics interface with individualised care delivery, and what differences may exist between different patient subgroups such as those with diabetes type 1 and 2) in the published literature and emphasis on clinical outcomes rather than psychosocial measures have also hindered a more detailed analysis.

Future research and health service impact

~~Better reporting of interventions and long-term ethnographic studies, also focusing at the organisational level, would provide a more detailed understanding of how and why group clinics work (or not) for young people. The role of group clinics in creating efficiencies in the health service requires further research. This realist review has already provided a foundation for the ongoing development and evaluation of a new care model using group clinics for young people with diabetes as part of a larger programme of work undertaken in a multidisciplinary diabetes clinic in the UK.~~

The four principles arising from this evidence synthesis of group clinics for young adults (emphasising self-management as practical knowledge; developing a sense of affinity between patients; providing safe, developmentally-appropriate care; and balancing group and individual needs) could be usefully tested more widely. These principles could guide clinicians and health service providers to tailor and operationalise their application in existing services. Additionally, the principles could guide researchers in the development and evaluation of other models of group-based care in varied healthcare settings, and perhaps expanding to other long-term conditions and patient groups. The researchers involved in this realist review are themselves already using these principles as part of a larger programme of work that aims to implement, co-design and evaluate group clinics for young people with diabetes in the UK (17). Further research on group clinics for young people should better inform administrative decision-making within health services through the inclusion of measures such as direct and indirect costs of running group clinics, patient attendance and engagement, adherence to treatment, emergency attendances and hospital admissions, and their impact on wider social factors.

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