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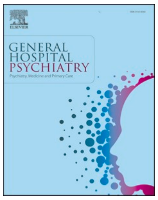

Implementing collaborative care for major depression in a cancer center: An observational study using mixed-methods

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ABSTRACT

Objectives: To describe the implementation of a collaborative care (CC) screening and treatment program for major depression in people with cancer, found to be effective in clinical trials, into routine outpatient care of a cancer center.

Method: A mixed-methods observational study guided by the RE-AIM implementation framework using quantitative and qualitative data collected over five years.

Results: Program set-up took three years and required more involvement of CC experts than anticipated. Barriers to implementation were uncertainty about whether oncology or psychiatry owned the program and the hospital's organizational complexity. Selecting and training CC team members was a major task. 90% (14,412/16,074) of patients participated in depression screening and 61% (136/224) of those offered treatment attended at least one session. Depression outcomes were similar to trial benchmarks (61%; 78/127 patients had a treatment response). After two years the program obtained long-term funding. Facilitators of implementation were strong trial evidence, effective integration into cancer care and ongoing clinical and managerial support.

Conclusion: A CC program for major depression, designed for the cancer setting, can be successfully implemented into routine care, but requires time, persistence and involvement of CC experts. Once operating it can be an effective and valued component of medical care.

1. Introduction

This observational study describes the implementation of a collaborative care program for major depression, developed specifically for patients attending cancer clinics and found to be effective in randomized trials, into the routine clinical care of a cancer center.

1.1. *The collaborative care service model*

There are many arguments for better integration of psychiatry into medical care, including improved access to care and better outcomes. But integrating care requires major changes to how services are currently delivered [1,2]. The collaborative care (CC) service model aims to achieve integration [3]. Specific CC programs vary in content, but all are based on the following principles: (a) the systematic identification of patients with a psychiatric disorder, usually using a screening system; (b) the delivery of evidence-based treatments by a team of psychiatrists and care managers who work collaboratively with patients' general medical providers; and (c) a "treat to target" approach in which treatment is adjusted to achieve specified improvements in patient outcomes [4]. The early CC programs were developed to improve the outcomes of patients with depression in primary care [5]. Subsequently programs have been developed for other patient populations, such as the one we describe here for patients with major depression in the cancer care setting.

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1.2. A collaborative care program for patients with cancer and major depression

Two of the authors of this article (MS and JW) designed a CC program for patients attending hospital-based cancer clinics and evaluated it in a series of randomized trials. The program specifically aims to improve the outcomes of patients with cancer and comorbid major depression. It has been described in detail in previous publications [6,7]. Here, we summarize its rationale, overall design, and how its two main components (depression screening and depression treatment) are delivered.

1.2.1. Rationale for the collaborative care program

Major depression affects about 10% of cancer outpatients [8]. It is important because it is associated with impaired quality of life, reduced adherence to anticancer treatments and worse survival [9–11]. However, the majority of cancer patients with depression do not receive adequate treatment for it [12]. There are a number of reasons for this failure of care [13]: First, the diagnosis of depression is frequently missed. Patients may not mention relevant symptoms and oncology clinicians often lack the knowledge, skills and confidence to diagnose depression. Second, effective treatment is often not initiated due to confusion between 'normal' psychological adjustment to having cancer and a psychiatric disorder that requires treatment. Third, the availability and capacity of psychiatrists and other skilled mental health clinicians to provide optimal treatment for major depression is usually limited in the cancer setting. Fourth, patients may not wish to be referred to external mental health services which are typically not designed to treat psychiatric disorders in patients with cancer. These failures of care are all addressed in the CC program by systematically identifying patients with major depression and efficiently providing them with specialist-delivered treatment that is integrated into their cancer care [6,7].

1.2.2. Overall design of the collaborative care program

The CC program is designed to be led by consultation-liaison (C-L) psychiatrists, who supervise a number of care managers. The CC team works in close collaboration with the patients' oncology and primary care teams. The CC team members share clinical space and patient notes with the oncology clinicians and have many formal and informal interactions with them. They also communicate regularly with patients' primary care community physicians. The C-L psychiatrists are board-certified psychiatrists with substantial experience of working in medical settings. The care managers in the program are specially trained nurses or allied health professionals (there is no tradition of social workers occupying these roles in the UK) with experience of cancer care. These professional backgrounds were chosen in order to integrate the patient's depression care with their cancer care and to avoid the stigma associated with free-standing "psychiatric" treatment [14]. Because they are familiar with cancer and its treatment, the care managers are comfortable discussing cancer-related problems with patients and able to collaborate effectively with the oncology team. However, their background means that they require intensive training in the diagnosis and treatment of depression and the CC program; the selection and training of care managers has been described in detail in a previous publication [15].

1.2.3. Depression screening in the CC program

The depression screening component of the CC program aims to identify patients with major depression, in particular those for whom the linked treatment program is considered suitable (see below). It uses a conventional two-stage procedure [6]. In the first stage, patients complete a self-rating scale (e.g. the Hospital Anxiety and Depression Scale or the Patient Health Questionnaire) [16,17]. They do this in the cancer clinic, using touchscreen computers while waiting for their appointment. In the second stage, patients with a high score on the scale are offered a telephone-delivered diagnostic interview (based on the major depression section of the Structured Clinical Interview for the Diagnostic and Statistical Manual of Mental Disorders) to determine whether they meet diagnostic criteria for major depression [18]. These interviews are conducted by the care managers and take an average of approximately 15 min. Telephone interviews are more feasible to deliver than interviews in the clinic, are convenient and acceptable to patients, and yield findings similar to those of face-to-face interviews [19,20].

If patients meet criteria for major depression, their oncology team and primary care physician are informed. These patients are also offered participation in the linked depression treatment (see below) if they meet the following criteria: (a) they are able to attend and participate in sessions, i.e. they do not have substantial cognitive impairment or communication difficulties, or very limited English; (b) the treatment is appropriate to their needs, i.e. they do not have chronic depression (persistent depressive disorder) or a psychiatric or medical condition requiring a different type of treatment and they are not already receiving specialist depression treatment from another service. Patients for whom the treatment is not appropriate are either seen in the C-L psychiatry outpatient clinic, referred to community mental health clinics, or signposted to other services.

1.2.4. Depression treatment in the CC program

The depression treatment component of the CC program is called 'Depression Care for People with Cancer' (DCPC) [7]. The delivery of DCPC follows a detailed manual and comprises a number of treatment elements, as well as coordination of care and monitoring of outcomes. The treatment elements include both antidepressant medication and talking treatments. Pharmacological and psychological approaches are used simultaneously in DCPC because there is evidence that a combined approach is most effective [21].

Care managers see patients for a maximum of ten DCPC sessions over four months at the cancer center (with some sessions delivered over the telephone if required). The care managers have a number of tasks: (a) they aim to establish a therapeutic relationship and a shared understanding of depression with the patient; (b) they encourage the patient to consider antidepressant medication, prescribed by the primary care physician or oncologist; (c) they provide behavioral activation and problem-solving therapy; (d) they monitor the patient's symptoms of depression at each treatment session using the nine-item Patient Health Questionnaire (PHQ-9) [17]; (e) they coordinate the patients' depression care by communicating with primary care physicians, oncology clinicians and any other relevant health professionals (e.g. palliative care physicians).

The supervising C-L psychiatrists advise oncologists and primary care physicians about psychiatric aspects of the patients' care including prescribing antidepressant medication and also provide direct consultations to patients who are not improving. The C-L psychiatrists also lead group supervision of the care managers. This follows a standardized format: The care managers present all new cases, then the team discuss patients who have not yet responded to treatment (the specified improvement, using the 'treat to target' approach, is a reduction of $\geq$50% in their PHQ-9 score). Finally, the whole team watch selected sections of the recorded treatment sessions (all DCPC treatment sessions are digitally video-recorded with patients' permission) with the aim of maintaining fidelity to the manual, allowing care managers to bring cases that they are concerned about and giving the C-L psychiatrists confidence in their supervision of patients' depression care.

1.3. Evaluations of the collaborative care program

The CC program described above has been evaluated in a series of research studies conducted in cancer centers in Scotland, UK. Both the studies and the delivery of the CC program within them, were funded by research grants. The research included the SMaRT Oncology randomized controlled trials. These trials recruited patients attending cancer clinics, who had been diagnosed with major depression by the screening component of the program and for whom DCPC was deemed a suitable treatment (see above). The trial participants were randomly allocated to receive either DCPC or usual care (in which their primary care physician and oncologist were informed of their depression diagnosis and encouraged to treat it).

The initial proof-of-concept trial, SMaRT Oncology-1, recruited 200 patients and found that those who received DCPC had significantly greater reductions in their depression severity at three-month follow-up than those who received usual care [21]. It was followed by SMaRT Oncology-2, a multicenter effectiveness trial which recruited 500 patients with good prognosis cancers and major depression. The trial found a very large treatment effect, with 62% of patients who received DCPC having a treatment response at six-month follow-up compared with only 17% of patients who received usual care [22]. Similar findings were reported by SMaRT Oncology-3, which recruited 142 patients with lung cancer (a poor prognosis cancer) and major depression (see https://www.thelancet.com/depression-and-cancer) [23]. A health economic study of the whole CC program, incorporating data from both depression screening and treatment components, found it to be cost-effective [24].

1.4. Implementation of the collaborative care program

1.4.1. Implementation science

It is increasingly recognized that there is a gap between care found to be effective in research and care that is delivered in routine clinical practice, and that this 'implementation gap' will need to be bridged if we are to have evidence-based care [25]. The gap exists because the translation of interventions from research studies into routine clinical care is not a straightforward task [26]. Consequently they may be implemented badly, if at all [27]. This is particularly the case for complex or multi-faceted interventions like CC programs [28].

The field of implementation science aims to improve the process of translation from research into routine care [29,30]. Implementation science studies include those which aim to: (a) explain what influences implementation; (b) test the effectiveness of implementation strategies; and (c) describe and evaluate the success of implementation efforts.

1.4.2. Implementation study setting

The study we report here describes and evaluates the success of implementing the CC program described above into routine clinical care. The setting was the Oxford Cancer Centre, which is part of a large National Health Service (NHS) multi-site teaching hospital (Oxford University Hospitals) in England, UK. The cancer center receives approximately 20,000 new patient referrals per year. In common with all NHS services, it serves a geographically defined population and is publicly funded. Patients attend the cancer center for confirmation of their cancer diagnosis, anticancer treatments (including initiation of adjuvant endocrine therapy) and post-treatment review (patients who are disease-free are discharged to primary care for follow-up). They are seen by oncologists (many of whom are also involved in research), surgeons, cancer nurse specialists and allied health professionals. All patients who attend the cancer center also have an NHS primary care physician who works in the community. Prior to implementing the CC program, the hospital had a referral-based C-L psychiatry service for inpatients, but the cancer center had no dedicated C-L psychiatry or psychology time for adult outpatients.

The hospital's implementation plan was to: (a) implement the CC program as it was delivered in the SMaRT Oncology clinical trials; (b) augment CC with additional C-L psychiatry clinics for patients with more complex problems not suitable for DCPC (e.g. depression comorbid with primary brain or head and neck cancers, chronic depression); (c) start the program in solid tumor clinics and defer its implementation in hematologic cancer clinics (which are in a separate hospital department) in the first instance.

The academic experts who had developed and evaluated the CC program in other cancer centers (MS and JW, who were also members of the study team) were to support the implementation by giving presentations, providing the CC program manual used in the SMaRT Oncology trials and helping to select and train the new CC team.

1.4.3. Previous literature

A number of previous studies have described the implementation of CC into routine primary care. These have identified both barriers to, and facilitators of, this process [31,32]. Although there have been descriptions of CC programs operating in the cancer setting [33–36], we are unaware of any systematic descriptions of the implementation of a CC program into routine cancer care.

1.4.4. Study aims

We therefore aimed to describe and evaluate the implementation of the aforementioned CC program into the routine outpatient care provided by the Oxford Cancer Centre, using the five dimensions of the RE-AIM framework: Reach, Effectiveness, Adoption, Implementation, Maintenance [37]. We chose to use RE-AIM, from the implementation models and frameworks available, because it provided a practical structure for the prospective collection of data to describe and evaluate implementation [38].

2. Methods

2.1. Study design

We conducted a prospective observational study using mixed-methods; the protocol has been published [39]. We mapped our specific study aims to the (re-ordered) RE-AIM dimensions as follows: (a) describe the setting-up (Adoption) of the CC program including the facilitators of and barriers to set-up; (b) describe and evaluate the extent to which patients participated in the program (Reach); (c) evaluate the extent to which the program was delivered as intended and describe relevant facilitators and barriers (Implementation); (d) evaluate how well the program worked (Effectiveness); and (e) describe the sustainability of the program as part of routine care (Maintenance) (see Table 1).

2.2. Data sources

The relevant data sources for each of our study aims, including how they map onto the RE-AIM framework, are listed in Table 1.

2.2.1. Contemporaneous log

We recorded all significant implementation activities and events (from January 2014 to December 2019) in a contemporaneous log. Each log entry included information on the date of the activity or event, people involved and effects on the implementation process.

2.2.2. Routine clinical data

We collected the following data, recorded in the CC program's clinical databases between August 2017 and December 2019: the number of clinic attendees screened; the age and sex of patients offered DCPC; patients' PHQ-9 depression scores at DCPC sessions. A C-L psychiatrist (LS) reviewed the care managers' notes from each DCPC session to determine whether each session included the components specified in the manual (antidepressant medication discussion or monitoring, behavioral activation and problem-solving therapy).

2.2.3. Interviews

We conducted 83 semi-structured interviews: 51 with health professionals and 32 with patients (see appendix). We used purposive sampling to include: (a) health professionals and managers involved in setting up the CC program; (b) C-L psychiatrists and care managers in the CC team; (c) other health professionals who worked in the cancer center; (d) patients who had participated in the CC program. The

Table 1
Aims, data sources and analysis mapped to the RE-AIM framework.

Aims: to describe and evaluate	Relevant dimension of the RE-AIM framework (Glasgow 1999)	Data sources	Analysis
The setting-up of the CC program	Adoption: The absolute number, proportion, & representativeness of settings & intervention agents who are willing to initiate a program and why.	- Contemporaneous log - Interviews with healthcare professionals	- Milestones in CC program set-up - Reported facilitators of set-up - Reported barriers to set-up
The patients who participated in the CC program	Reach: The absolute number, proportion, & representativeness of individuals who are willing to participate in a given initiative.	- Routine clinical data	- Number & proportion of oncology clinic attendees screened for depression - Number & proportion of patients offered DCPC who attended ≥1 session - Characteristics of patients who attended ≥1 DCPC session and who declined DCPC
The extent to which the CC program was implemented as intended	Implementation: The intervention agents' fidelity to the various elements of an intervention's protocol.	- Routine clinical data - Interviews with healthcare professionals	- Proportion of patients with a high score at the first stage of depression screening who received a diagnostic interview - Proportion of relevant DCPC sessions that included (a) antidepressant medication discussion or monitoring, (b) behavioral activation, (c) problem-solving therapy - Reported facilitators of implementation as intended - Reported barriers to implementation as intended
How well the CC program worked	Effectiveness: The impact of an intervention on important outcomes, including potential negative effects, quality of life, & economic outcomes.	- Routine clinical data - Interviews with patients - Interviews with healthcare professionals	- Patients' positive and negative experiences of the CC program - Health professionals' positive and negative experiences of the CC program - Proportion of patients who attended ≥2 DCPC sessions who had a treatment response at their final session, defined as a 50% reduction in their PHQ-9 score from their first session, benchmarked against trial findings
The sustainability of the CC program as part of routine care	Maintenance: The extent to which a program or policy becomes institutionalized or part of routine organizational practice or policies.	- Contemporaneous log - Interviews with healthcare professionals	- Milestones in CC program sustainability - Reported facilitators of sustainability - Reported barriers to sustainability

CC = collaborative care; DCPC=Depression Care for People with Cancer; PHQ-9 = Patient Health Questionnaire-9.

interviews were conducted by clinical researchers and were audio-recorded and transcribed verbatim. The interview topic guides focused on: (a) health professionals' views of the facilitators of and barriers to program set-up; (b) health professionals' views of the facilitators of and barriers to implementation as intended; (c) patients' and health professionals' positive and negative experiences of the program; (d) health professionals' views of the facilitators of, and barriers to, program sustainability. Interviews focusing on set-up were conducted between September 2016 and July 2017. The remainder were conducted between October 2017 and March 2018, except for a final follow-up interview with the lead C-L psychiatrist in August 2021 to ensure that we had captured effects of the Covid-19 pandemic on program sustainability.

2.3. Analysis

The relevant analyses for each of our study aims, including how they map onto the RE-AIM framework, are listed in Table 1.

We used the contemporaneous log to construct a timeline, illustrating the major milestones that occurred during implementation.

We analyzed the routine clinical data using descriptive statistics. Categorical variables were summarized using absolute and relative frequencies, and continuous variables using medians and interquartile ranges (IQR). We used a bar chart to plot the percentage of DCPC sessions that included each of the treatment components.

We analyzed the interview data using a hybrid of the deductive and inductive approaches to thematic analysis [40,41]. We initially used the deductive approach to code data into the major pre-defined themes: 'barrier', 'facilitator', 'positive experience', and 'negative experience'. This provided a framework for grouping data that was aligned with our research questions and also allowed the researchers to quickly familiarize themselves with all the interview data [40,41]. We then inductively coded data within these themes and grouped the codes into categories. The analysis was undertaken by a multidisciplinary team (comprising the following professions: psychologist, nurse, psychiatrist, researcher). In order to enhance the quality of the analysis, researcher triangulation was carried out and any discrepancies in our process of coding were discussed and resolved until consensus was achieved.

2.4. Ethical approval

The study protocol was reviewed by a joint committee of Oxford University Hospitals NHS Foundation Trust Research and Development Department and the University of Oxford's Clinical Trials and Research Governance Department and was judged to be service evaluation, not requiring ethics committee approval. All interviewees provided written informed consent.

3. Results

3.1. The setting-up of the CC program (Adoption)

The decision to initiate the CC program was made by hospital managers, in response to requests from senior clinicians, soon after publication of the SMaRT Oncology-2 and 3 trial findings in 2014 [22,23] (see Fig. 1 for timeline). This decision was reinforced by the recommendation to implement the program in national clinical guidance [42]. The initial CC team members were selected and trained in 2015. The C-L psychiatrists were already working in the hospital. The care managers were recruited specifically to the role.

Health professionals reported that the ongoing engagement and commitment of the hospital managers, and the increasing recognition of unmet patient need by clinicians, facilitated the setting-up of the CC program (see Table 2). Additional facilitators were the substantial research evidence for the program's effectiveness and the involvement of academic CC experts.

Despite these facilitators, there were substantial delays in completing set-up and the program did not start operating until 2017 (see Fig. 1). The main barrier to progress was a series of delays resulting from lack of clarity about whether the hospital's C-L psychiatry or the oncology service should 'own' the program, with each thinking it should be the other. Despite the initial management agreement to fund the program, there were ongoing disputes about which budget funding for the CC

2014	2015	2016	2017	2018	2019
SMaRT Oncology-2 & 3 trials published Decision to initiate the CC program made by hospital managers in response to requests from senior clinicians	Initial CC team members selected and trained	Initial CC team members leave CC experts agree to become more involved in leading and facilitating the implementation process Charitable start-up funding agreed	C-L psychiatry takes ownership New CC team members selected and trained Oncology provides office space for the CC team CC program starts in small number of clinics	CC program operating in most solid tumor clinics as planned	CC program long-term funding confirmed Plan for CC program to expand to hematologic cancer clinics

Fig. 1. Implementing a collaborative care program for major depression into a cancer center: timeline and milestones.
CC=collaborative care; C-L=consultation-liaison

program should come from. C-L psychiatry saw that the benefits of the program would be in improving cancer care and oncology viewed the program as being a psychiatric one. Related barriers included practical challenges such as failure to allocate a room to house the CC team, the cancer center's unfamiliarity with both C-L psychiatry and CC, and concerns of clinic staff about how the development might interfere with their current work practices (in particular, whether the first stage of depression screening would slow up clinics). The hospital's organizational complexity was an additional barrier, with the necessary decisions being referred to multiple committees.

One consequence of these delays was the departure of initially appointed and trained CC team members. The resulting crisis was only resolved after the CC experts agreed (in discussion with the rest of the study team) to become more involved in leading and facilitating the implementation process being pursued by the hospital, rather than simply advising. This involvement increased momentum; C-L psychiatry took ownership and oncology provided space for the CC team. The funding dispute was overcome in the short-term by the hospital obtaining new 'pump-priming' funding from a cancer charity.

3.2. The patients who participated in the CC program (Reach)

Most (90%;14,412/16,074) of the patients who attended oncology clinics where the CC program was operating were screened for depression (see Fig. 2). Of the patients offered DCPC (those with major depression for whom this was considered to be a suitable treatment, as described above), 61% (136/224) attended at least one session (the median number of sessions attended was 7). Patients who attended DCPC sessions were on average younger and more likely to be female (median age 55 years, IQR 47 to 64; 80% female) than those who declined it (median age 65.5 years, IQR 51.5 to 72.5; 72% female).

3.3. The extent to which the CC program was implemented as intended (Implementation)

Depression screening was observed to be implemented largely as intended. 75% (2094/2808) of patients who scored high on the self-rating scale received a diagnostic interview for major depression, similar to the percentage observed in the research studies (see Fig. 2).

Depression treatment was also implemented largely as intended. 52% (224/427) of patients with major depression were offered DCPC; similar to the percentage in the research studies. The most common reasons that patients were not offered DCPC were: they required a different treatment (such as for chronic depression or a comorbid substance use disorder), they were too unwell due to their poor cancer prognosis, or they were already seeing a mental health specialist.

Most (96%; 861/901) of relevant DCPC sessions included antidepressant medication monitoring; most (93%; 836/901) included behavioral activation and a somewhat lower percentage of sessions (73%; 383/522) also included problem-solving therapy (see Fig. 3).

Reported facilitators of implementation as intended were: the training of CC staff by experts in the program, the use of a manual and the standardized supervision of care managers including review of video-recordings of DCPC sessions (see Table 3).

The main barriers to implementation as intended were challenges in selecting and training clinical staff for the new CC team and obtaining supporting IT.

Although the psychiatrists selected were experienced in C-L psychiatry, they had no previous experience of CC, which was much more systematic and integrated than their usual practice. As a result, they required substantial training in both the style of working and the specific therapies they had to supervise (behavioral activation and problem-solving therapy) from the CC experts.

Because the care managers were nurses and allied health professionals with experience of cancer care but not mental health care, they had to be taught about depression and its diagnosis as well as being trained in delivering the DCPC treatment by the CC experts. This training required that they change their style of interacting with patients from giving advice, as is typical in cancer care, to encouraging patients to problem-solve for themselves (the challenge of making this shift may explain the lower fidelity with this component of DCPC described above).

The lack of a suitable bespoke IT system to manage the large amounts of data and work flow associated with depression screening (i.e. to identify all patients attending the clinic to offer them screening and list those with a high score on the rating scale to ensure that they are contacted for a diagnostic interview) and treatment outcome monitoring (i.e. to track patients' PHQ-9 scores at their DCPC sessions) made CC inefficient. Whilst the CC team used the same individual electronic patient records as the oncology clinicians, it did not offer these functions and they had to rely on labor-intensive completion of spreadsheets.

3.4. How well the CC program worked (Effectiveness)

Patients' and health professionals' experiences of the CC program are summarized in Table 4. Patients described both depression screening and DCPC as helpful, liked that they were delivered by people they regarded as experts, and welcomed the CC program as part of cancer care. However, some patients disliked having to attend the cancer center for DCPC sessions and some said that their cancer care and depression care were insufficiently joined-up.

Oncology clinicians reported that they experienced both depression screening and DCPC as improving patient care and that, despite some initial trepidation, they now valued their presence in the cancer center. Some said that the program helped them to be more aware of depression and to treat patients with depression themselves, whereas others were relieved to hand over the responsibility for this aspect of care to the CC team. Some expressed disappointment that the CC team did not see

Table 2
The setting up of the collaborative care program: reported facilitators and barriers.

Facilitators	Buy-in from hospital and cancer center managers	"it's about…making sure that where patients present to us with a physical health need but also have a mental health need, are we managing both of those to the right level?" (manager) "one of the things we are charged with is trying to promote and encourage optimum care" (manager)
	Recognition of unmet patient need by oncology clinicians	"we sometimes knew that patients were depressed but there was nowhere for us to get them sent to without a long wait" (nurse) "I haven't got the time or the skills…I'm not the resource to manage that problem" (oncologist) "if they're feeling a bit down, they don't always want to tell the doctor or the specialist nurse" (nursing assistant)
	Involvement of CC experts	"I think having [the CC experts] involved all the way through has been very helpful" (manager) "the [expert] came and spoke to us…and presented data…so we knew about it coming which was great" (oncologist) "the enthusiasm from [the experts]…they definitely believe in what they're trying to achieve, which is great, it's lovely to work with people like that, it's opened our eyes" (manager)
	Research evidence for the CC program's effectiveness	"It's the way we should do projects, it's evidence-based, it's testing work that we know will make a difference" (charitable funder) "there's really outstanding evidence that's already been collected that is supportive…so I think that helped" (manager)
	Short-term charitable funding	"Getting [charity] funding was fantastic because I think that will make a big difference" (manager)
Barriers	Lack of clarity whether C-L psychiatry or oncology should own the program	"this is a cancer center…if you are looking for time and space, what could be outsourced, what could go elsewhere? And I think [the program]…could be run from elsewhere" (manager) "I saw it as a project for psychiatry and thought they will run it the way they want to run it, rather than this is an oncology team project and we need to make sure it runs properly" (manager) "we had a discussion of whose administrator [was coordinating implementation]…we thought it's a cancer center administrator…they thought it was our [C-L psychiatry] administrator" (C-L psychiatrist)
	Lack of clarity how the CC program would be funded	"there was difficulty getting funding" (manager) "we couldn't get agreement…that they [NHS reimbursement] would definitely pay" (manager)
	Lack of clarity where the CC team would be housed	"there was concern there would be no office space for these staff to move into" (manager) "the challenge we have with a lot of services is the physical space" (manager)
	Organizational complexity	"everything has to go through multiple people with different opinions before you can get a decision about anything" (CC expert) "they will have to repeat messages time and time again, and that's par for the course for any new service, maybe more so with this because it such a change in what people will be used to" (charitable funder) "when you are implementing new things from start…if you think things are gonna go smoothly, then you're living in a different world" (manager) "it's easy to sell a big idea…it's really hard to overcome the practical day-to-day sticky things" (CC expert)
	Cancer center's unfamiliarity with C-L psychiatry and CC	"you're saying we want you to invest in something you have never seen…that's a tough sell" (C-L psychiatrist) "it is a very specific, very structured approach…screening a lot of people to work out who needs the specific care…which actually I don't disagree with but it's trying to get our heads round that approach" (manager)
	Concerns about interference with current work practices	"it can impact on us…doing our own assessments" (nurse) "psychologists' group…their noses were put a little bit out of joint" (manager) "you might say, does it slow up clinics?" (oncologist)

CC = collaborative care; C-L = consultation-liaison.

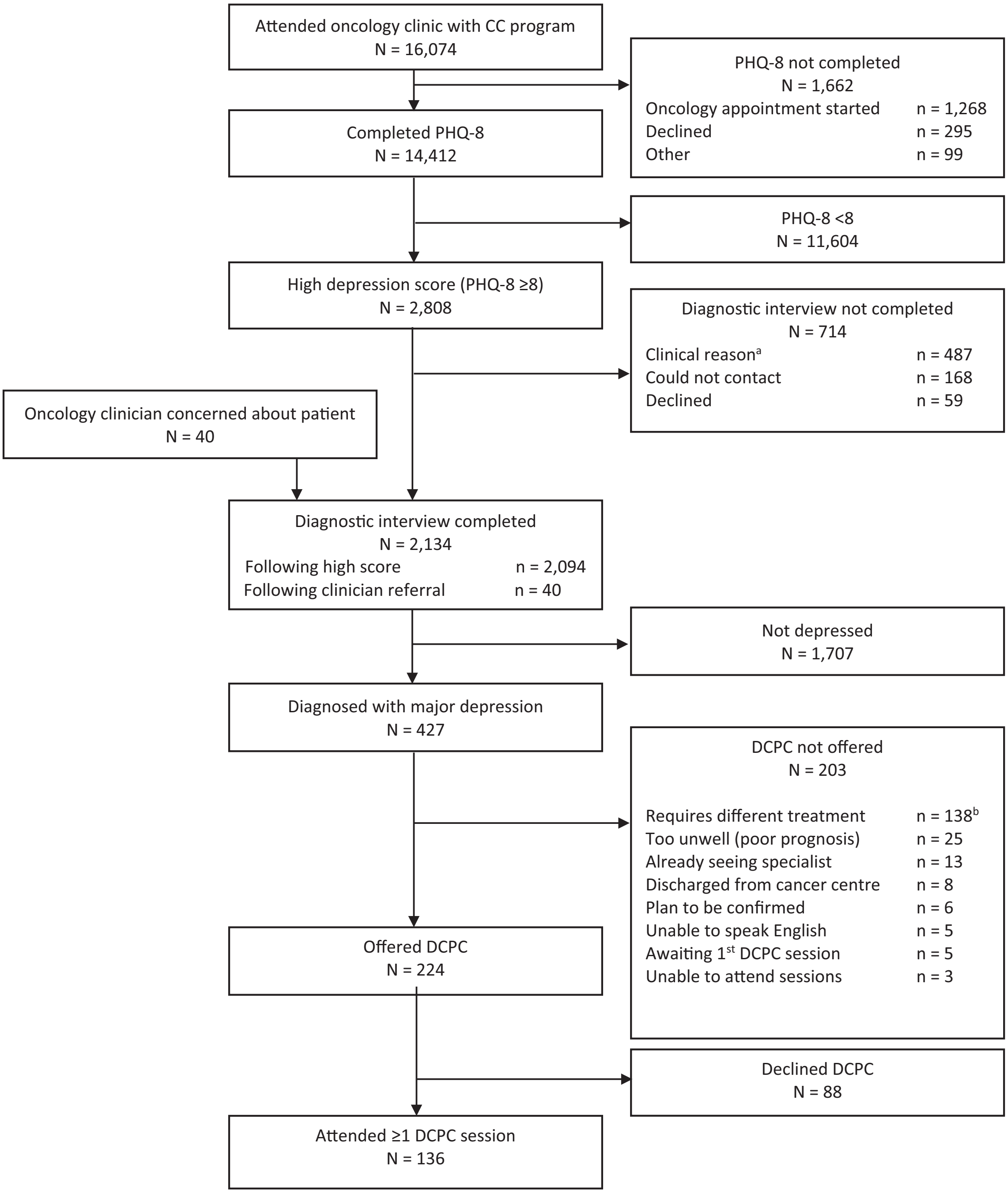

Fig. 2. Flowchart of depression screening and treatment.
Data from August 2017 to December 2019. [a] e.g. too unwell, significant cognitive impairment, already seeing mental health specialist. [b] e.g. chronic depression, comorbid substance use disorder. CC=collaborative care. PHQ=Patient Health Questionnaire. DCPC=Depression Care for People with Cancer.

patients outside of its planned remit. This included those with problems other than depression (e.g. adjustment disorders) or patients who had been discharged from cancer care back to primary care.

Once established the program worked well. The majority (61%; 78/127) of patients who started DCPC and attended at least two sessions had a treatment response by their final session (defined as a 50% reduction in their PHQ-9 depression score from their first session). This outcome was similar to the benchmark provided by the SMaRT Oncology-2 trial, in which 62% of patients allocated to DCPC had a treatment response at six months [22].

3.5. *The sustainability of the CC program as part of routine care (Maintenance)*

By the end of 2018 the CC program was operating in most solid tumor clinics as planned (see Fig. 1). The C-L psychiatrists were also providing consultations (in a twice weekly clinic) and making referrals to other services for patients with more complex problems. Reasons for patients to be seen in the C-L psychiatrists' clinic included chronic depression, severe anxiety disorders, adjustment disorders and organic psychiatric disorders.

In 2019 the hospital agreed to provide long-term funding for the CC program and to plan for its expansion into hematologic cancer clinics.

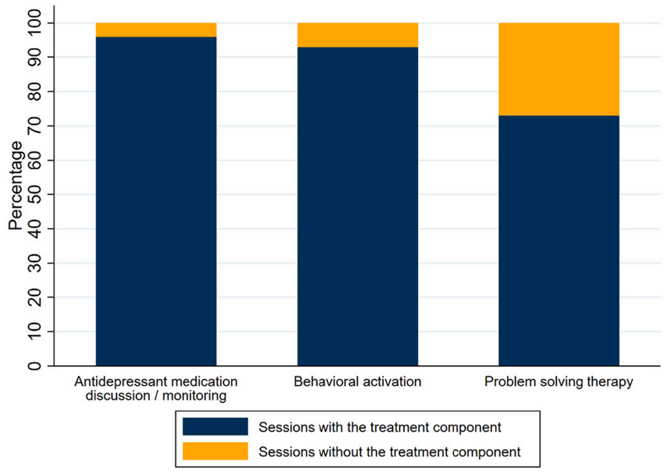

Fig. 3. Percentage of Depression Care for People with Cancer treatment sessions that included each of the three treatment components.

The key facilitators of sustainability were reported to be the ongoing commitment of both hospital managers and oncology clinicians, who saw that the program helped patients and fitted into cancer care, as well as the good relationships that the CC team had established with other cancer care staff (see Table 5).

The main barrier to achieving long-term sustainability was the limited capacity of the CC team, which led to them often becoming overstretched. This overstretch was exacerbated by the ongoing lack of an IT system that could support workflow, despite efforts to secure one. Consequently, when a care manager left, the program had to be paused in some clinics whilst a replacement was recruited and trained. Another barrier was turnover of oncology managers and clinicians, because new staff had no experience of CC and some did not consider depression management to be a part of cancer care.

In the follow-up interview conducted in 2021 the lead C-L psychiatrist reported that, although staff had been partially redeployed during the Covid-19 pandemic, the CC program was once again running in the solid tumor clinics and had begun to operate in hematologic cancer clinics with additional funding. Covid-19 had prompted successful adaptations: the first stage of screening was now done online or by telephone and the majority of DCPC sessions (apart from the first which was still face-to-face) were by video-consultation. However, the IT system to support workflow was still awaited.

4. Discussion

4.1. Main findings

The main finding of this study is that a CC program for major depression, found to be effective in clinical trials, was successfully implemented into the routine clinical care of a cancer center. The setting-up of the program encountered significant barriers; it took three years, and required an unanticipated amount of facilitation from the CC experts. Once the program was operating, patient participation in both depression screening and treatment was good. The program was delivered largely as specified and depression outcomes were similar to those found in the clinical trials [22,23]. A lack of supporting IT remained a problem. After two years of operation, the program was given long-term funding from the hospital. During the Covid-19 pandemic it adapted its practices to incorporate a greater use of telemedicine.

4.2. Discussion of main findings and relevant literature

4.2.1. Setting-up the CC program

Many of the important facilitators of program set-up observed in this

Table 3
The implementation of the collaborative care program as intended: reported facilitators and barriers.

Facilitators	Training by CC experts	“the biggest thing is not underestimating the amount of actual training time they need, which is not just their time, but time of people skilled in the task to train them” (CC expert)
	Use of the CC manual	“the manual’s really good…it’s very real terminology and real conversation…and all the paperwork that comes with each session…it’s laid out very clearly and concisely” (care manager)
	Use of standardized supervision and video-recorded DCPC sessions	“every session is recorded so…I’m able to watch videos and see how [the care managers] are functioning” (C-L psychiatrist)
Barriers	Challenges of selecting and training C-L psychiatrists to deliver CC	“it’s totally different from the way that psychiatrists normally work” (CC expert) “going through all the cases, doing it systematically and being really engaged as supposed to just being there in the background for people to come to, is a very different role” (CC expert) “this whole experience has taken me back to basics almost” (C-L psychiatrist)
	Challenges of selecting and training care managers to deliver CC	“It’s getting that balance of how you find somebody who has the maturity to do the post but hasn’t learnt too many things that need to be unlearnt” (manager) “it is such a different way of working” (care manager) “you can’t fix everybody’s problems and what you need to do is, is enable them to find ways to manage things themselves…that’s a big learning curve for me” (care manager)
	Coordinating training of the CC team	“if you’re trying to create a system it’s not just about training individuals, it’s about creating the skills and capability of the team to interact together” (CC expert) “ideally I would have liked everyone to have had the same training but train the psychiatrist…earlier” (CC expert)
	Lack of suitable IT systems	“the IT system isn’t there and it hasn’t even been started to be built” (expert) “I think the IT department had to try to get the whole hospital on an electronic patient record so it became lower priority” (manager)

CC = collaborative care; C-L = consultation-liaison.

Table 4
How well the collaborative care program worked - patients' and health professionals' positive and negative experiences.

Patients' experiences		
Positive experiences	Screening for depression helped	"I have felt a bit down…it's quite a good thing to be able to tell someone"
		"it's asking questions which often aren't asked"
		"I could have got a lot worse…I was blaming all my symptoms [on] …the chemotherapy"
		"telling me [it was depression] rather than just being lazy or feeling sorry for myself"
		"I was definitely floundering on the rocks so it was quite nice to have somebody reach out, grab hold of me"
	DCPC helped	"it saved my life basically"
		"just felt like getting myself back again"
		"It made me…mentally strong enough to deal with it [cancer treatment]"
		"I feel much better equipped to deal with a similar situation if it arises again"
		"rather than people just talking about your feelings, this was actually helping me to solve the issues in my life"
	Good to have the program as part of cancer care	"the medical situation…is trying to cure me…someone was taking care of the mental side of things"
		"it fits really well with the other treatments"
		"it's odd when you go to the hospital and they refer you to another hospital…it's good that everything is in one place, one stop shop"
	Good to see depression expert	"I knew it was confidential and I knew she wasn't involved in my life in any other way, I felt safe"
		"there was somebody who seemed to know what they were talking about…it struck me that I was being treated for the right thing, by people who had experience"
Negative experiences	Having to attend the cancer center	"the fact that I had to go in and out of the hospital so many times, got a bit of a chore"
		"hospitals aren't everybody's favorite place"
	Not joined up enough	"I think they could have been more joined up with…my oncologist"

Health professionals' experiences		
Positive experiences	Screening for depression is helpful for patients	"it's really good at helping identify people that wouldn't ordinarily have been identified" (nurse)
		"intervention can take place in a more timely fashion and not let things escalate…much more proactive" (oncologist)
	DCPC is helpful for patients	"I think it's a really important service for the patients 'cause it probably is make or break for some of them" (nurse)
		"makes them feel more confident about having their chemotherapy and I think actually prevents some of the side effects" (oncologist)
	Good to have the CC program in the cancer center	"putting a face to it…taking any sort of taboo out of it and we're all there for the same common goal, to have that presence is really useful" (oncologist)
		"it's just another string to our bow isn't it, just part of the team…it brings another dimension" (oncologist)
		"I think it's nice for the patient to know that they're being looked at as a whole and not just from a physical point of view…from a mental point of view as well" (nurse)
		"they'd have to go to different places and I think having the service in one place is much better" (nursing assistant)
	Helps oncology clinicians care for patients with depression	"it's just giving us that confidence…the team is supporting us in clinic means we can prescribe [antidepressants]…and we feel very happy that we're not doing anything wrong, we're not making things worse for the patient" (oncologist)
		"if they were feeling a bit down, they [care managers] might tell me, you know, different things to, to say to them" (nurse)
	Relieves oncology clinicians of responsibility for managing depression	"it's good to have somebody that specializes in it, so then you get the best" (oncologist)
		"knowing that you don't have to do the mental aspect of things because somebody else is doing it" (oncologist)
Negative experiences	CC program is limited to identifying and treating depression	"the only downside is [the CC team] don't see everybody" (nurse)
	Patients no longer attending the cancer center are not offered DCPC	"if the patients been discharged the service is not offered to them but if they've scored really highly what do we do?…a letter is sent to their GP…one of my colleagues is unhappy with that" (oncologist)

CC = collaborative care; C-L = consultation-liaison; DCPC=Depression Care for People with Cancer.

Table 5
The sustainability of the collaborative care program as part of routine care: reported facilitators and barriers.

Facilitators	Ongoing support from oncology clinicians	"for a long time we've recognized that there's a psychological need but perhaps we've seen it a as small piece of the pie whereas actually I think it's a very big piece…this is beginning to acknowledge that" (oncologist) "it's sharing care in a very direct way…actually having the CC team integrally based in the clinic means that's much more joined up for us and I think all the feedback from patients has been extremely positive" (oncologist)
	Ongoing support from managers	"that made a huge difference…the [oncology] clinical director actually endorsing what we're doing and supporting it, and being seen to be doing that" (C-L psychiatrist)
	Fits in with rest of cancer care	"they have radiotherapy and then they come straight to their DCPC session or…they have their DCPC session then go round to the chemotherapy unit" (C-L psychiatrist) "it hasn't changed how clinics run" (oncologist) "It's just sort of slotted in…as if it's always been here" (nurse)
	Good relationships between CC team and cancer center staff	"I'm around…attend the oncologists' meetings…go to their social events" (C-L psychiatrist) "the team is, is sunny, and friendly, and supportive and I think, you take that on and help each other" (nurse)
Barriers	CC team running at full capacity	"we've done some real heavy lifting in terms of training up the care managers. If we lose one of them, it's going to be a struggle keeping everything going" (C-L psychiatrist) "it's a victim of its success because it's running at full capacity without any slack" (CC expert)
	Lack of suitable IT	"the numbers of people we are screening …we've gotten to stage where using spreadsheets is becoming really difficult" (C-L psychiatrist) "there's a lot of confusion about who's picking up what" (C-L psychiatrist)
	Turnover of oncology managers and clinicians	"there have been several times when they [new clinical manager] have tried to move the care managers out [of the clinic] and said you're not core to delivering cancer care" (C-L psychiatrist) "the message needs to be reinforced, so you know there are consultants that have been there a long time who get it and there are no problems, but equally there are…new consultants starting who have got no clue as to what is happening" (C-L psychiatrist)

CC = collaborative care.

study, such as the co-location of the CC team and the medical team, have also been previously observed in primary care settings [31,32]. Other facilitators such as the strong research evidence, direct involvement of academic experts, and support of managers at multiple levels seem to be more characteristic of implementation of new medical services in hospital settings [43].

Many of the barriers we observed to set-up, namely the lack of prior experience of the benefits of CC and concern about anticipated changes in ways of working by the host service, have also been noted in primary care [31,32]. However other important barriers such as the lack of clarity regarding roles and responsibilities of the different clinical services, seem to be relatively specific to the hospital setting [43].

4.2.2. Participation in the CC program, the extent to which it was delivered as intended and how well it worked

The acceptance of depression screening by patients was helped by its integration into their cancer care. The finding that the uptake of DCPC treatment was good, but not as high as for screening, may reflect the requirement to attend the cancer center for treatment; a problem that may have been partly addressed by the program's increased use of telemedicine during the Covid-19 pandemic.

The task of translating a complex intervention like CC from a research setting to routine clinical care is not to be underestimated [44]. A major challenge is the tension between 'fidelity' (i.e. delivering the program as it was when evaluated in the trials) and 'adaptation' (i.e. changing the way it is delivered to accommodate demands of the implementation setting) [45]. In this case the hospital's aim to deliver the program as in the trials (including recording of all treatment sessions) was largely achieved. Pressures to adapt the program to include large numbers of patients with 'distress' and those who had been discharged from cancer care or to reduce the quality of care manager supervision were successfully resisted by the program clinicians.

Whilst we know that CC can be successfully expanded to treat a wider range of disorders than major depression, such an expansion requires care managers to have greater skills and risks a loss of effectiveness [46]. A balance therefore has to be struck between fidelity and adaption. In the setting of a cancer center we need to accept that CC alone will never be the answer to all psychiatric problems; other provision, including more generic support for distressed individuals, specialist C-L psychiatry clinics and referral to other mental health services will still be required [36].

The implemented CC program worked well: patients' depression scores improved and both patients and oncology clinicians found it helpful. This was a particularly positive finding, given the 'voltage drop' in effectiveness that can occur when translating interventions from research to routine care, and likely reflects the fidelity of implementation [47]. Patients' and oncology clinicians' views of the program were informative. Whilst both groups valued cancer and depression experts working together, some patients and oncologists wanted these clinicians to retain separate roles. This, and similar findings from primary care, are consistent with the idea that integrating psychiatry into medical care does not necessarily mean that all clinicians do everything, but rather that team members with differing expertise work independently but collaboratively around the patient [48,49].

4.2.3. Sustainability of the CC program as part of routine care

The CC program's success in becoming sustainable was attributed not only to clinicians seeing that it helped their patients, but also to how well it fitted in with cancer care. This finding reflects the design of the program specifically for the cancer setting, but is important given the early concerns of clinical staff that it might slow patient flow in clinics. It is also clear both from our findings and from other studies, that the work of implementing CC is never done; CC team members reported having to continually refresh their engagement with new oncology staff as well as coping with turnover in the CC team itself [50].

4.3. Wider literature on implementing integrated care

A previous report of a multi-site study has described many of the barriers to integrating psychiatry into medical care [2]. These included the practical manifestations of the separation of mental and physical care such as separate budgets, health records and office space. It also highlighted the need for culture change; meaning the acceptance not only of the idea of integration, but also of adjustments in work processes that it requires of all involved. CC is a well-established service model for integrating psychiatry into medical care. Many studies describing its implementation in primary care have been published [31,32]. Much less attention has been paid to the study of implementing CC into the specialist medical care setting; we found only one published description in an HIV clinic [51]. Although we are not aware of any previous studies of implementing CC in the specialist setting of cancer care, there are useful accounts of working in such services and of training CC teams to work in such settings [15,33,35,36].

4.4. Strengths and limitations of the study

This study has a number of strengths: (a) we prospectively studied the implementation into routine care of a well-described CC program which had clear evidence of effectiveness in the cancer setting from clinical trials; (b) we used a combination of quantitative and qualitative data; (c) we planned data collection and analysis using a well-established and comprehensive framework (RE-AIM); (d) we collected data over a five-year period.

It also has limitations: (a) we studied implementation in the clinics of a single UK NHS academic cancer center with no preexisting dedicated C-L psychiatry provision, potentially limiting generalizability; (b) as with most service evaluation studies, we had limited information from those patients who declined participation in the CC program; (c) we also lacked information on the experiences of primary care providers (although each would have few patients involved in the CC program); (d) given the large number of interviews conducted it was not feasible to check the themes we identified with the interviewees; (e) we do not have data to describe in detail what happened prior to set-up (i.e. the period during which initial discussions took place about whether to implement the program); (f) the study team included the experts who designed the CC program and who ended up facilitating its implementation, potentially leading to bias in the interpretation of findings.

4.5. Implications for implementation of CC in specialist medical settings such as cancer centers

The main implication of our findings is that the implementation of a specially designed CC program for major depression into a specialist medical setting can be successfully achieved, but requires substantial time, effort and expertise. Whilst buy-in from all parties is necessary, this alone is insufficient. Our experience suggests that an early and concrete plan, clearly specifying, for example, who will fund and manage the program, may help to avoid delays. However, given the complexity of the hospital setting, obstacles will almost certainly emerge; both strong leadership and expert facilitation may then be needed to overcome them [52]. It is also essential to be aware that implementing CC requires changes in practice for all involved and that if these changes are poorly understood, they may be resisted. It is therefore important to see the implementation of CC not only through the eyes of psychiatry but also through those of medical services: What do they think the new program will look like? Do they expect it to help or hinder their already pressured work? What is their previous experience of ‘mental health services’? We found that lack of prior experience of C-L psychiatry in the cancer center was a challenge, with some clinicians not understanding why a CC program should focus on the identification and treatment of major depression rather than providing ‘general support’ to all distressed patients and others skeptical of the place of psychiatry in cancer care.

It is important to recognize that the new CC team members may need to work in a way that is quite different to their previous practice and that they are therefore likely to require substantial training [15]. To achieve this the active involvement of CC experts is required. These experts may be needed to provide leadership for the implementation as well as expertise in CC. Detailed supervision of treatment sessions is desirable in order to maintain treatment quality, the confidence of care managers in providing treatment and the confidence of C-L psychiatrists in their supervision. That supervision may be enhanced by joint reviews of video-recordings of treatment sessions.

4.6. Implications for implementation research in C-L psychiatry

Like most medical specialties, C-L psychiatry needs to do better, not only at generating research evidence but also at learning how to successfully implement that evidence in routine care. The findings of implementation studies such as this one can help us to understand how we can achieve that goal [53]. Our findings also tell us that those studying implementation should not underestimate both the amount and unpredictability of the time required and should ensure that research funding is sufficiently flexible. They also highlight an important question for implementation researchers: how much should they remain as independent observers and how much they should actively participate in the implementation process? Whilst studies may benefit from the involvement of the researchers in the implementation process, the potential effects of this on the generalizability and objectivity of the study findings need to be considered [54,55].

We mapped our study aims onto the dimensions of the RE-AIM framework. We chose RE-AIM because we wanted to describe and evaluate implementation, rather than for example compare different implementation strategies. We found the RE-AIM dimensions useful for guiding data collection and analysis. However, they are perhaps best suited to studying changes in the practice of existing staff, rather than the creation of a completely new service and team. We also found that the narrative of reporting worked better with the dimensions listed in a different order from the acronym as described above.

4.7. Conclusions

A specially designed CC program for major depression in people with cancer, found to be effective in clinical trials, can be successfully implemented into routine cancer center care. However, it may take time and persistence. As well as strong buy-in from all parties involved, the availability of experts in CC and clarity of ownership of the program by a specific hospital service are important. Once established CC can become a fully accepted and highly valued part of cancer care.

Disclosures

NS is the director of the London Safety and Training Solutions Ltd., which offers training in patient safety, implementation solutions and human factors to healthcare organisations and the pharmaceutical industry. The other authors have no conflicts of interest to declare.

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Appendix A. Supplementary data

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