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

**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.

**KEYWORDS:** Collaborative care; Cancer; Depression; Implementation

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.

*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 minutes. 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 or 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 ≥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).

[Table 1 about here]

*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 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 Figure 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.

[Figure 1 and Table 2 about here]

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 Figure 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 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 Figure 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).

[Figure 2 about here]

*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% (2,094/2,808) 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 Figure 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 Figure 3).

[Figure 3 about here]

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.

[Table 4 about here]

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 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 Figure 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. 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).

[Table 5 about here]

The main barrier to achieving long-term sustainability was the limited capacity of the CC team, which led to them often becoming over-stretched. 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 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.

*4.5 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.

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**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.

**REFERENCES**

[1] Sharpe M and Naylor C. Integration of mental and physical health care: from aspiration to practice. Lancet Psychiatry 2016;3:312-3.

[2] Kathol RG, Butler M, McAlpine DD and Kane RL. Barriers to Physical and Mental Condition Integrated Service Delivery. Psychosomatic Medicine 2010;72:511-518.

[3] Katon W, Unutzer J, Wells K and Jones L. Collaborative depression care: history, evolution and ways to enhance dissemination and sustainability. Gen Hosp Psychiatry 2010;32:456-64.

[4] Katon W. Collaborative depression care models: from development to dissemination. Am J Prev Med 2012;42:550-2.

[5] Katon W, Von Korff M, Lin E, Walker E, Simon GE, Bush T, et al. Collaborative Management to Achieve Treatment Guidelines: Impact on Depression in Primary Care. JAMA 1995;273:1026-1031.

[6] Walker J, Wanat M, Fielding J, Martin P, Petit A, Burke K, et al. Screening Medical Patients for Depression: Lessons From a National Program in Cancer Clinics. Psychosomatics 2017;58:274-280.

[7] Walker J and Sharpe M. Depression Care for People with Cancer: a collaborative care intervention. Gen Hosp Psychiatry 2009;31:436-41.

[8] Walker J, Hansen CH, Martin P, Symeonides S, Ramessur R, Murray G, et al. Prevalence, associations, and adequacy of treatment of major depression in patients with cancer: a cross-sectional analysis of routinely collected clinical data. Lancet Psychiatry 2014;1:343-50.

[9] Kroenke K, Theobald D, Wu J, Loza JK, Carpenter JS and Tu W. The association of depression and pain with health-related quality of life, disability, and health care use in cancer patients. Journal of pain and symptom management 2010;40:327-341.

[10] Walker J, Mulick A, Magill N, Symeonides S, Gourley C, Burke K, et al. Major depression and survival in people with cancer. Psychosomatic medicine 2021;83:410-416.

[11] Colleoni M, Mandala M, Peruzzotti G, Robertson C, Bredart A and Goldhirsch A. Depression and degree of acceptance of adjuvant cytotoxic drugs. The Lancet 2000;356:1326-1327.

[12] Walker J, Holm Hansen C, Martin P, Sawhney A, Thekkumpurath P, Beale C, et al. Prevalence of depression in adults with cancer: a systematic review. Ann Oncol 2013;24:895-900.

[13] Greenberg DB. Barriers to the treatment of depression in cancer patients. JNCI Monographs 2004;2004:127-135.

[14] Hodges L, Butcher I, Kleiboer A, McHugh G, Murray G, Walker J, et al. Patient and general practitioner preferences for the treatment of depression in patients with cancer: how, who, and where? J Psychosom Res 2009;67:399-402.

[15] Wanat M, Walker J, Hodges L, Richardson A and Sharpe M. Selecting, training and supervising nurses to treat depression in the medically ill: experience and recommendations from the SMaRT oncology collaborative care trials. General Hospital Psychiatry 2015;37:518-521.

[16] Zigmond AS and Snaith RP. The hospital anxiety and depression scale. Acta Psychiatr Scand 1983;67:361-70.

[17] Kroenke K, Spitzer RL and Williams JB. The PHQ-9: validity of a brief depression severity measure. J Gen Intern Med 2001;16:606-13.

[18] First MB, Spitzer RL, Gibbon M and Williams JBW. Structured Clinical Interview for DSM-IV Axis I Disorders. Biometrics Research, New York State Psychiatric Institute, USA, 1999.

[19] Simon GE, Revicki D and VonKorff M. Telephone assessment of depression severity. J Psychiatr Res 1993;27:247-52.

[20] Allen K, Cull A and Sharpe M. Diagnosing major depression in medical outpatients: acceptability of telephone interviews. J Psychosom Res 2003;55:385-7.

[21] Strong V, Waters R, Hibberd C, Murray G, Wall L, Walker J, et al. Management of depression for people with cancer (SMaRT oncology 1): a randomised trial. Lancet 2008;372:40-8.

[22] Sharpe M, Walker J, Holm Hansen C, Martin P, Symeonides S, Gourley C, et al. Integrated collaborative care for comorbid major depression in patients with cancer (SMaRT Oncology-2): a multicentre randomised controlled effectiveness trial. Lancet 2014;384:1099-108.

[23] Walker J, Hansen CH, Martin P, Symeonides S, Gourley C, Wall L, et al. Integrated collaborative care for major depression comorbid with a poor prognosis cancer (SMaRT Oncology-3): a multicentre randomised controlled trial in patients with lung cancer. Lancet Oncol 2014;15:1168-76.

[24] Walker S, Walker J, Richardson G, Palmer S, Wu Q, Gilbody S, et al. Cost-effectiveness of combining systematic identification and treatment of co-morbid major depression for people with chronic diseases: the example of cancer. Psychol Med 2014;44:1451-60.

[25] Dopson S, Locock L, Gabbay J, Ferlie E and Fitzgerald L. Evidence-based medicine and the implementation gap. Health: An interdisciplinary journal for the social study of health, illness and medicine 2003;7:311-330.

[26] Pinnock H, Barwick M, Carpenter CR, Eldridge S, Grandes G, Griffiths CJ, et al. Standards for Reporting Implementation Studies (StaRI) Statement. BMJ 2017;356:i6795.

[27] Proctor EK, Landsverk J, Aarons G, Chambers D, Glisson C and Mittman B. Implementation research in mental health services: an emerging science with conceptual, methodological, and training challenges. Adm Policy Ment Health 2009;36:24-34.

[28] Senn B, Kirsch M, Sanz C, Karlou C, Tulus K, De Leeuw J, et al. Developing and evaluating complex interventions: the new Medical Research Council guidance. Studies 2013;59:587-592.

[29] Eccles M and Mittman B. Welcome to Implementation Science. Implementation Science 2006;1:1.

[30] Rubenstein LV and Pugh J. Strategies for promoting organizational and practice change by advancing implementation research. J Gen Intern Med 2006;21 Suppl 2:S58-64.

[31] Wood E, Ohlsen S and Ricketts T. What are the barriers and facilitators to implementing Collaborative Care for depression? A systematic review. J Affect Disord 2017;214:26-43.

[32] Overbeck G, Davidsen AS and Kousgaard MB. Enablers and barriers to implementing collaborative care for anxiety and depression: a systematic qualitative review. Implement Sci 2016;11:165.

[33] Courtnage T, Bates NE, Armstrong AA, Seitz MK, Weitzman TS and Fann JR. Enhancing integrated psychosocial oncology through leveraging the oncology social worker's role in collaborative care. Psychooncology 2020;29:2084-2090.

[34] Irwin KE, Park ER, Fields LE, Corveleyn AE, Greer JA, Perez GK, et al. Bridge: Person-Centered Collaborative Care for Patients with Serious Mental Illness and Cancer. Oncologist 2019;24:901-910.

[35] Fann JR, Ell K and Sharpe M. Integrating psychosocial care into cancer services. J Clin Oncol 2012;30:1178-86.

[36] Beach SR, Walker J, Celano CM, Mastromauro CA, Sharpe M and Huffman JC. Implementing collaborative care programs for psychiatric disorders in medical settings: a practical guide. Gen Hosp Psychiatry 2015;37:522-7.

[37] Glasgow RE, Vogt TM and Boles SM. Evaluating the public health impact of health promotion interventions: the RE-AIM framework. Am J Public Health 1999;89:1322-7.

[38] Nilsen P. Making sense of implementation theories, models and frameworks. Implement Sci 2015;10:53.

[39] Wanat M, Walker J, Burke K, Sevdalis N, Richardson A, Mulick A, et al. Linked symptom monitoring and depression treatment programmes for specialist cancer services: protocol for a mixed-methods implementation study. BMJ Open 2017;7:e016186.

[40] Fereday J and Muir-Cochrane E. Demonstrating rigor using thematic analysis: a hybrid approach of inductive and deductive coding and theme development. International Journal of qualitative methods 2006;5.

[41] Braun V and Clarke V. What can "thematic analysis" offer health and wellbeing researchers? Int J Qual Stud Health Well-being 2014;9:26152.

[42] Independent Cancer Taskforce. Achieving World-Class Cancer Outcomes: A Strategy for England 2015-2020. 2015.

[43] Cowie J, Nicoll A, Dimova ED, Campbell P and Duncan EA. The barriers and facilitators influencing the sustainability of hospital-based interventions: a systematic review. BMC Health Services Research 2020;20:588.

[44] Craig P, Dieppe P, Macintyre S, Michie S, Nazareth I and Petticrew M. Developing and evaluating complex interventions: the new Medical Research Council guidance. BMJ 2008;337:a1655.

[45] Moore JE, Bumbarger BK and Cooper BR. Examining Adaptations of Evidence-Based Programs in Natural Contexts. The Journal of Primary Prevention 2013;34:147-161.

[46] Oosterbaan DB, Verbraak MJPM, Terluin B, Hoogendoorn AW, Peyrot WJ, Muntingh A, et al. Collaborative stepped care v. care as usual for common mental disorders: 8-month, cluster randomised controlled trial. British Journal of Psychiatry 2013;203:132-139.

[47] Kilbourne AM, Schulberg HC, Post EP, Rollman BL, Belnap BH and Pincus HA. Translating evidence-based depression management services to community-based primary care practices. Milbank Q 2004;82:631-59.

[48] Knowles SE, Chew-Graham C, Coupe N, Adeyemi I, Keyworth C, Thampy H, et al. Better together? a naturalistic qualitative study of inter-professional working in collaborative care for co-morbid depression and physical health problems. Implementation Science 2013;8:110.

[49] Kodner DL and Spreeuwenberg C. Integrated care: meaning, logic, applications, and implications--a discussion paper. Int J Integr Care 2002;2:e12-e12.

[50] Moise N, Shah RN, Essock S, Jones A, Carruthers J, Handley MA, et al. Sustainability of collaborative care management for depression in primary care settings with academic affiliations across New York State. Implementation Science 2018;13:128.

[51] Curran GM, Pyne J, Fortney JC, Gifford A, Asch SM, Rimland D, et al. Development and implementation of collaborative care for depression in HIV clinics. AIDS Care 2011;23:1626-36.

[52] Ritchie MJ, Parker LE, Edlund CN and Kirchner JE. Using implementation facilitation to foster clinical practice quality and adherence to evidence in challenged settings: a qualitative study. BMC Health Services Research 2017;17:294.

[53] Bauer MS and Kirchner J. Implementation science: What is it and why should I care? Psychiatry Research 2020;283:112376.

[54] Medical Research Council. Process evaluation of complex interventions. <https://mrc.ukri.org/documents/pdf/mrc-phsrn-process-evaluation-guidance-final/>, 2014.

[55] Peters DH, Tran NT and T A. Implementation research in health: a practical guide.: Alliance for Health Policy and Systems Research, World Health Organization, 2013.