

BMJ Open Interventions to improve screening and appropriate referral of patients with cancer for psychosocial distress: systematic review

Kristen McCarter,¹ Ben Britton,² Amanda L Baker,² Sean A Halpin,¹ Alison K Beck,² Gregory Carter,² Chris Wratten,³ Judith Bauer,⁴ Erin Forbes,² Debbie Booth,⁵ Luke Wolfenden²

To cite: McCarter K, Britton B, Baker AL, *et al.* Interventions to improve screening and appropriate referral of patients with cancer for psychosocial distress: systematic review. *BMJ Open* 2018;**8**:e017959. doi:10.1136/bmjopen-2017-017959

► Prepublication history and additional material for this paper are available online. To view these files, please visit the journal online (<http://dx.doi.org/10.1136/bmjopen-2017-017959>).

Received 27 May 2017

Revised 6 November 2017

Accepted 16 November 2017



CrossMark

¹School of Psychology, University of Newcastle, Callaghan, Australia

²School of Medicine and Public Health, University of Newcastle, Callaghan, Australia

³Department of Radiation Oncology, Calvary Mater Newcastle Hospital, Waratah, Australia

⁴Centre for Dietetics Research, University of Queensland, St Lucia, Australia

⁵University Library, University of Newcastle, Callaghan, Australia

Correspondence to

Kristen McCarter;
Kristen.McCarter@newcastle.edu.au

ABSTRACT

Objectives The primary aim of the review was to determine the effectiveness of strategies to improve clinician provision of psychosocial distress screening and referral of patients with cancer.

Design Systematic review.

Data sources Electronic databases (Cochrane Central Register of Controlled Trials, MEDLINE, EMBASE, PsycINFO and Cumulative Index to Nursing and Allied Health Literature (CINAHL)) were searched until July 2016.

Inclusion criteria Population: adult patients with cancer and clinical staff members. Intervention: any strategy that aimed to improve the rate of routine screening and referral for detected distress of patients with cancer. Comparison: no intervention controls, 'usual' practice or alternative interventions. Outcome: (primary) any measure of provision of screening and/or referral for distress, (secondary) psychosocial distress, unintended adverse effects. Design: trials with or without a temporal comparison group, including randomised and non-randomised trials, and uncontrolled pre–post studies.

Data extraction and analysis Two review authors independently extracted data. Heterogeneity across studies precluded quantitative assessment via meta-analysis and so a narrative synthesis of the results is presented.

Results Five studies met the inclusion criteria. All studies were set in oncology clinics or departments and used multiple implementation strategies. Using the Grades of Recommendation, Assessment, Development and Evaluation, the overall rating of the certainty of the body of evidence reported in this review was assessed as very low. Three studies received a methodological quality rating of weak and two studies received a rating of moderate. Only one of the five studies reported a significant improvement in referrals.

Conclusions The review identified five studies of predominantly poor quality examining the effectiveness of strategies to improve the routine implementation of distress screening and referral for patients with cancer. Future research using robust research designs, including randomised assignment, are needed to identify effective support strategies to maximise the potential for successful implementation of distress screening and referral for patients with cancer.

PROSPERO registration number CRD42015017518.

Strengths and limitations of this study

- This is the first review to systematically synthesise evidence of the effectiveness of strategies to improve the rate of routine distress screening and referral for patients with cancer.
- The review performed a comprehensive search of the literature, included controlled trials of any design and was inclusive of non-English literature.
- Few studies met the inclusion criteria, and heterogeneity of study design, primary and secondary outcomes precluded quantitative synthesis.

INTRODUCTION

Rationale

Psychosocial distress can be defined as an unpleasant experience of an emotional or psychological nature, including depression, anxiety and other/mood/adjustment disorders.¹ Estimates of the prevalence of psychosocial distress vary due to the type and stage of cancer, patient age, gender and race, as well as the definition of distress used. Psychosocial distress can arise in response to cancer-related factors such as diagnosis and cancer progression, pain and adverse effects of treatment. Psychosocial distress in patients with cancer may lead to non-adherence to treatment, poorer quality of life and may negatively impact survival, as well as increase treatment burden to the oncology team and health system.^{1–4} Therefore, recognising and treating distress in cancer populations are an important health priority.

Professional associations and clinical guidelines including the National Comprehensive Cancer Network (NCCN) *Clinical Practice Guidelines in Oncology: Distress Management*¹ recommend that those responsible for the

care of patients with cancer routinely screen for distress and, as appropriate, refer for further assessment and support. Clinical practice guideline recommendations are based on evidence that screening improves the timely management of distress,^{3 5} and on systematic reviews and meta-analyses that have demonstrated psychosocial intervention reduces distress (such as depression and anxiety^{6 7}), particularly when participants are prescreened.⁸

The efficacy of distress screening for improving patient outcomes has been challenged in the literature. A recent systematic review failed to find evidence that distress screening improved distress outcomes among patients with cancer.⁹ Another systematic review that examined screening for distress in cancer settings found that those studies reporting a lack of benefit to distress screening in patients with cancer lacked appropriate follow-up care of distressed patients, while trials that linked screening with mandatory referral or intervention showed improvement in patient outcomes.¹⁰ While screening itself may not be sufficient to improve patient outcomes, it is a necessary prerequisite to identify those patients who could benefit from evidence-based treatment and guides clinical decision making.¹ Consequently, clinical guidelines recommend screening *and* referral protocols in cancer settings. It is clear that well-designed trials are needed to further evaluate the effectiveness of screening and referral on patient outcomes. However, in the absence of strong evidence from robust trials that suggests distress screening and referral should not be conducted, clinicians should be guided by clinical practice guidelines.

Despite clinical practice guideline recommendations, screening and referral of patients with cancer for psychosocial distress are not routinely conducted by clinicians responsible for the clinical management of cancer.^{1 2 11} Beginning in 2015, the American College of Surgeons Commission on Cancer has required cancer centres to implement programmes for distress screening as a criterion for accreditation.¹² A recent cross-sectional survey of 20 NCCN institutions reported only 60% of services conducted outpatient distress screening, and even fewer services reported screening all patients (30%) as outlined in the NCCN standards.¹¹ Systematic reviews of trials of strategies to improve depression or anxiety screening in primary care note that complex organisational interventions that incorporate multiple strategies are most effective in improving provision of care.^{13–15} Such strategies include clinician education, opinion leaders, patient-specific reminders, enhanced role of nurses, academic detailing, integrating screening into routine clinical reviews and a greater degree of coordination between services (eg, between primary and secondary care).^{13–15} However, we are not aware of any previous systematic review of interventions to improve clinician routine provision of distress screening and appropriate referral of patients with cancer per se. It

is the discrepancy between these guideline recommendations and current practice that this review aims to address.

Objectives

The primary aim of this review was to assess for patients with cancer the impact of trials of strategies to improve clinician delivery of psychosocial distress care compared with usual care on rates of psychosocial distress screening and referral for further assessment and/or psychosocial support.

The following were the secondary aims of the review:

- i. To describe the effectiveness of such interventions on reducing psychosocial distress of patients with cancer.
- ii. To describe any unintended adverse effects of such an intervention.

METHODS AND ANALYSIS

The review will be reported consistent with the Preferred Reporting Items for Systematic Reviews and Meta-Analyses statement.¹⁶ The details of the methods have been reported elsewhere,¹⁷ and the protocol is registered with PROSPERO (registration number CRD42015017518).

Eligibility criteria

Study characteristics

Types of studies

Original studies including randomised controlled trials and non-randomised trials were included. Exclusion criteria were trials without parallel comparison or control groups. Due to the limited number of studies (explained further in the Results section), we later included studies without parallel control groups including uncontrolled pre–post studies. There were no restrictions based on length of follow-up, year of study publication or language. Studies could be published in peer review or grey literature.

Participants

Participants could include adult patients with cancer and clinical staff members such as physicians and allied health professionals responsible for the care of patients with cancer. Studies that examined screening for psychosocial distress and/or referral for carers of patients with cancer, or survivors of cancer, were excluded.

Types of interventions

Interventions of strategies that aimed to improve the rate of screening procedures for psychosocial distress and/or rate of referral for appropriate psychosocial support in healthcare settings were included. There are a range of potential strategies that could improve the likelihood of implementation of distress screening and referral in healthcare settings. For example, the Cochrane Effective Practice and Organisation of Care (EPOC) taxonomy is a framework for characterising

educational, behavioural, financial, regulatory and organisational interventions within the topic of 'implementation strategies'¹⁸ and includes 22 subcategories. Examples of strategies within the taxonomy include educational materials, performance monitoring, local consensus processes and educational outreach visits. Included interventions could be singular or multicomponent. Studies using clinical judgement of psychosocial distress alone, without use of a formal screening tool, were excluded. Referral for psychosocial support was defined as any written or verbal offer or direction of a patient for further review, consultation, assessment or treatment with any health professional, including the primary oncology team or health service, offering psychosocial support such as psycho-oncology services. Studies were included if they implemented either distress screening only or distress screening and appropriate referral. Studies where research staff conduct screening or referral were excluded.

Comparisons

Studies with no intervention controls, 'usual' practice periods or alternative intervention comparison groups were included.

Outcomes

Primary outcomes

1. Any measure of the provision of screening for psychosocial distress (eg, number or % of patients with cancer screened).
2. Any measure of the provision of referral for further assessment and/or psychosocial support (eg, number or % of patients with cancer referred) by a clinician responsible for the management of a patient with cancer.

Secondary outcomes

1. Any validated outcome measure of change in psychosocial distress levels in patients (eg, distress outcome assessments such as the Kessler Psychological Distress Scale).
2. Any measure of adverse effects on patients, clinicians or health services; or barriers to performing screening such as displacement of other clinical priorities.

Information sources

Electronic databases

The following electronic databases were searched for potentially eligible studies published up until July 2016: the Cochrane Central Register of Controlled Trials in the Cochrane Library, MEDLINE, EMBASE, PsycINFO and Cumulative Index to Nursing and Allied Health Literature (CINAHL). The MEDLINE search strategy (online supplementary file) was adapted for other databases and included filters used in other systematic reviews for population (cancer patients),¹⁹ screening for distress²⁰ and referral²¹ and psychosocial support.²²

Other sources

Studies were also obtained from the following sources:

- ▶ Reference lists of included studies.
- ▶ Hand-searching of three relevant journals in the field (published in the last 5 years): *Journal of the National Comprehensive Cancer Network*, *Psycho-Oncology* and *Supportive Care in Cancer*.
- ▶ Hand-searching of conference abstracts published in the preceding 2 years from the International Psycho-Oncology Society and the Society of Behavioral Medicine.
- ▶ A grey literature search using Google Scholar (published online in the last 5 years—the first 200 citations were examined).

Study selection

The titles and abstracts retrieved by electronic searches were exported to a reference management database (EndNote V.X6) to remove duplicates. Two reviewers independently screened abstracts and titles using a standardised screening tool that was pilot-tested with a sample of articles before use. The abstracts of papers that were in a language other than English were translated using Google Translate. If considered eligible or eligibility was unclear, professional translation of the full paper was undertaken.

The full texts of manuscripts were obtained for all potentially eligible trials for further examination and independently screened by two reviewers. For all manuscripts, the primary reason for exclusion was recorded and is documented in [figure 1](#). Discrepancies regarding study eligibility were resolved by discussion and consensus.

Data extraction

Two review authors (KM and EF) independently extracted data from the included trials using a pre-piloted data extraction form that was developed based on recommendations from the *Cochrane Handbook for Systematic Reviews of Interventions*.²³ Discrepancies regarding data extraction were resolved by discussion and consensus.

Data items

Data were sought for the following variables:

- ▶ Authors, year and journal.
- ▶ Study eligibility, study design, healthcare provider type (eg, nurses), country and healthcare setting (eg, oncology clinic).
- ▶ Patient characteristics and demographics, including cancer site, cancer stage, age, sex, cancer treatment type and treatment status (pre/undergoing/post).
- ▶ Characteristics of the intervention, including the duration, intervention strategies and screening instrument.
- ▶ Trial primary and secondary outcomes, including sample size, the data collection method, validity of measures used, any measures of client uptake or use

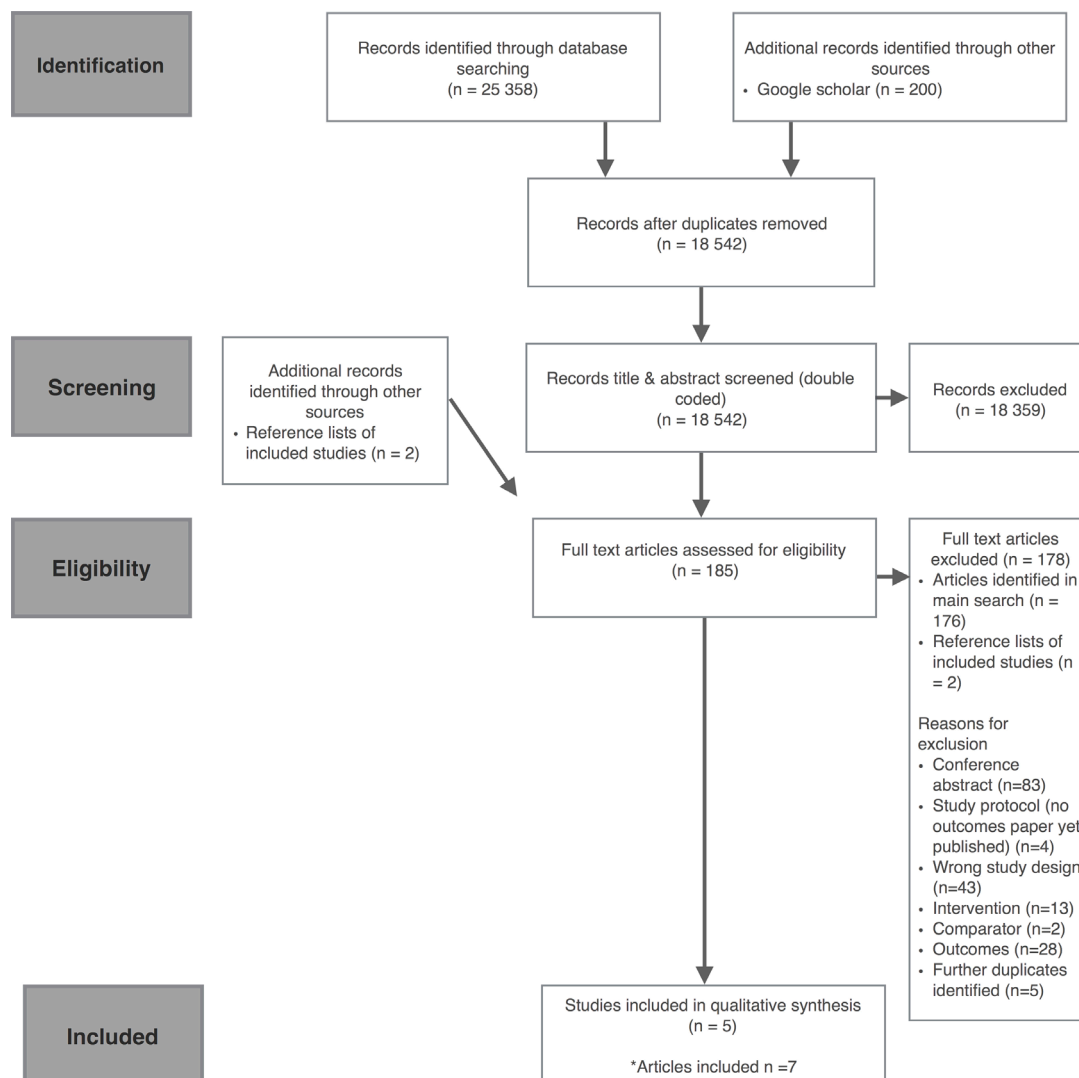


Figure 1 Preferred Reporting Items for Systematic Reviews and Meta-Analyses flow diagram.

of psychosocial support services following referral, effect size, and measures of change in distress.

- ▶ Number of participants per experimental condition.
- ▶ Information to allow assessment of risk of study bias.

Methodological quality assessment bias

Two review authors (KM and EF) independently assessed the risk of bias of all included trials using the Effective Public Health Practice Project (EPHPP) Quality Assessment Tool for quantitative studies.²⁴ The use of the EPHPP tool was a post-hoc change from protocol due to the study designs included in the review. This tool covers any quantitative study design and includes components of intervention integrity. Any discrepancies were resolved through discussion. The EPHPP assesses six methodological dimensions: selection bias, study design, confounders, blinding, data collection methods, and withdrawals and dropouts. These domains are rated on a 3-point scale (strong, moderate, weak) according to predefined criteria and procedures recommended for tool use, and then given an overall global rating. Those with no weak ratings

were given an overall rating of strong, those with one weak rating were given an overall rating of moderate and those with two or more weak ratings across the six domains were given an overall weak rating. Two additional methodological dimensions provided by the tool are intervention integrity and analyses, and these were also completed by the reviewers.

Data analysis

Summary measures

The small number of studies and differences in study design and primary and secondary outcomes reported in the included studies precluded the use of summary statistics to describe treatment effects. As such, the findings of included trials are described narratively.

Grading the strength of evidence

As recommended by the *Cochrane Handbook for Systematic Reviews of Interventions*,²³ the overall quality of evidence on primary outcomes is presented using the GRADE (Grades of Recommendation, Assessment, Development and Evaluation) approach, which involves consideration

of within-study risk of bias (methodological quality), directness of evidence, heterogeneity, precision of effect estimates and risk of publication bias. The overall quality of evidence was rated by two review authors (KM and EF) at four levels: high, moderate, low and very low.

RESULTS

A total of 18 542 citations were identified (after duplicates were removed) (figure 1) for abstract and title screening. Just one study met the eligibility criteria (ie, parallel control/comparison group). As such, and in an attempt to provide some evidence to guide researchers and practitioners regarding methods to improve patient distress screening and referral of patients with cancer, we relaxed the design criteria and post-hoc rescreened all 18 542 citations and included studies with controlled trial designs without parallel control groups including uncontrolled pre–post studies. The full text of 185 manuscripts were sought for further assessment against the review inclusion criteria (figure 1). Of these, 178 were considered ineligible following the trial screening process. Seven publications describing five trials were included in the review.

Included studies

Types of studies

A description of the trial characteristics of included studies is provided in table 1. One study was conducted in Japan,²⁵ one in the Netherlands,^{26–28} one in Germany,²⁹ one in Belgium³⁰ and one in Australia.³¹ Studies were published between 2009 and 2014. There was considerable heterogeneity in the participants, interventions and outcomes (clinical heterogeneity) of included studies.

Health providers

All studies were set in oncology clinics or departments. In regard to the healthcare providers responsible for conducting the distress screening and/or referral, one study targeted nurses,³¹ one targeted radiation oncologists,^{26–28} one required pharmacists to perform the screening,²⁵ one study involved both specialised breast care nurses and doctors²⁹ and one study used oncologists.³⁰

Interventions

All trials used multiple implementation strategies. The EPOC subcategories used to classify the implementation strategies employed by included studies in the review are provided in table 2. The interventions employed in the included studies, as well as the specific EPOC subcategories identified in each study, are presented in table 3. Using EPOC taxonomy descriptors, all trials included educational materials and educational meetings, with two trials using only these strategies.^{30 31} One trial used these strategies with the addition of educational outreach visits.^{26–28} One study used a combination of educational materials, educational meetings, educational outreach visits and reminders.²⁵ One study tested an intervention consisting of organisational culture, continuous quality

improvement, educational materials, educational meetings and reminders.²⁹

Outcomes

The primary and secondary outcomes are presented in tables 4 and 5. Implementation of distress screening and/or referral was primarily assessed using reviews of patient medical records^{25–29 31}; however, one study did not report the data collection method.²⁸ None of the studies reported which staff completed the medical record reviews. All trials reported the rates of referral for support for those patients identified as distressed; however, none of the studies examined the improvement in rates of distress screening. Change in distress levels was reported in one study.^{26–28} No study included a measure of potential adverse effects.

Study design characteristics

One of the included studies was a cluster randomised controlled trial,^{26–28} three were pre–post studies^{25 30 31} and one was a prospective consecutive study.²⁹ The cluster randomised controlled trial compared an intervention with a usual care control,^{26–28} three studies compared a screening programme period with a usual care period,^{25 30 31} and one trial compared a screening programme phase with a two-phase non-screening period.²⁹

Methodological quality assessment

Individual ratings for each study against the six methodological criteria from the EPHPP tool and the assigned global rating are reported in table 6. Overall, three studies received a methodological quality rating of weak^{29–31} and two studies received a rating of moderate.^{25–28} For three of the four non-randomised studies,^{29–31} it was unclear whether confounders were adequately adjusted for, and for the majority of studies blinding of outcome assessors or study participants was not described. While most studies reported medical record reviews for the data collection method, no reference was made to their validity or reliability as an outcome measure, nor was a description of who conducted the audits provided, resulting in weak ratings for all studies. All studies were judged as using analyses as appropriate to study design.

Effects of intervention on distress screening and/or referral

None of the included trials reported on the effects of strategies to improve rates of distress screening provision. Only one of the five studies reported a significant improvement in rate of referrals.²⁷ Zemlin *et al*²⁹ reported a significant positive trend for the proportion of patients who were informed/offered psycho-oncological interview ($t=22.40$, $df=2$, $P<0.001$). The effects of interventions are presented according to the implementation strategies (classified using the EPOC taxonomy) employed by included studies.

Educational materials and educational meetings

Two studies examined the impact of educational materials and educational meetings only on distress

Table 1 Trial characteristics

Study	Design	Study dates	Single-centre or multicentre	Setting	Country	Aim	Patient inclusion criteria	Patients (n)	Mean age in years (SD)	Gender (male)	Tumour site/tumour stage	Cancer treatment type/ stage of treatment
Theves <i>et al.</i> , 2009 ³¹	Pre-post	NR	Multicentre: 3 rural outpatient oncology clinics	Outpatient oncology clinics	Australia	(1) Prospectively investigate the feasibility and acceptability of introducing a routine psychological screening programme for rural oncology clinics; (2) explore the impact of screening on rates and timeliness of referral to psychosocial services; and (3) provide pilot data on the acceptability and utility of the DT as a screening tool within the rural Australian setting	(1) Newly diagnosed with malignant disease; (2) 18 years of age or older; (3) able to give informed consent; and (4) able to read English proficiently	Unscreened cohort: 40 Screened cohort: 43	60.0 (10.5 SD)	54.0%	Colorectal 22.9%, breast 30.1%, lung 14.5%, other 13.2%, haematological 9.6%, skin 6.0%, unknown primary 3.6% Localised/locally advanced or metastatic 28.9%	Surgery 75.9%, chemotherapy 66.3%, RT 53%, endocrine therapies 32.5% Newly diagnosed patients
Braeken <i>et al.</i> , 2009 ²⁶ 2013 ²⁷ and 2013 ²⁸	Cluster randomised controlled trial	April 2008–October 2010	Single	Institute Verbeeten (BVI), a radiation oncology department (Tilburg)	The Netherlands	To study the effect of the SIPP on the number and types of referrals of patients with cancer with psychosocial problems to psychosocial caregivers	(1) Receiving RT; (2) most common cancer types such as lung, prostate, bladder, rectum, breast, cervix, endometrial, skin and non-Hodgkin's; (3) 18 years of age or older; and (4) no metastases Exclusion criteria: (1) receiving palliative treatment, ≤10 fractions of RT; (2) unable to read and speak Dutch; and (3) unable to complete questionnaires	Control group: 300 Intervention group: 268	Control group: 62.4 (10.7 SD) Intervention group: 62.4 (10.8 SD)	Control group: 47.0% Intervention group: 31.7%	Prostate/bladder 24.1%, lung 11.3%, breast 50.0%, cervix/endometrial 1.6%, rectum 9.0%, non-Hodgkin's lymphoma 1.7%, skin 2.3%	100% RT SIPP before the first consultation prior to RT and SIPP2 before the consultation at the end of RT
Ito <i>et al.</i> , 2011 ²⁵	Pre-post	UP: 1 April to 30 September 2006 PP: 1 April 1 to 30 September 2007	Single	Outpatient treatment centre of the NCCH-E (Kashiwanoha, Kashiwa, Chiba)	Japan	To examine the usefulness (rate of referral) of a screening programme modified for outpatients with cancer who are undergoing chemotherapy	All consecutive patients with cancer who began chemotherapy at the outpatient treatment centre of NCCH-E in Japan	UP: 478 PP: 520	UP: 61.4 (10.8 SD) PP: 62.8 (10.9 SD)	UP: 54.0% PP: 56.7%	Lung 20.0%, colon/rectum 18.2%, breast 13.8%, haematopoietic and lymphatic tissue 12.8%, stomach 7.9%, pancreas 10.2%, oesophagus 5.5%, liver, bile duct, gall bladder 4.6%, head and neck 2.8%, other 4.0% Reported for PP only: stage I 2.5%, stage II 9.6%, stage III 20.8%, stage IV or recurrent 67.1%	Chemotherapy Patients beginning chemotherapy at the outpatient treatment centre of the NCCH-E

Continued

Table 1 Continued

Study	Design	Study dates	Single-centre or multicentre	Setting	Country	Aim	Patient inclusion criteria	Patients (n)	Mean age in years (SD)	Gender (male)	Tumour site/tumour stage	Cancer treatment type/ stage of treatment
Zemlin <i>et al.</i> , 2011 ²⁹	Prospective consecutive study	NR	Single	Clinic for Gynaecology of the University of Marburg Hospital (Marburg)	Germany	To examine whether a screening and computer-based psycho-oncological clinical pathway can improve the diagnosis of patients with breast cancer requiring psycho-oncological support according to current guidelines	Patients with breast cancer who were in stationary treatment	Phase I: 236 Phase II: 384 Phase III: 247	59.5 (12.2 SD)	0.6%	Breast 100% Stage 0 (ductal carcinoma in situ) 11.6%, stage I 43.7%, stage II 25.5%, stage III 7.8%, stage IV 11.2%	Screening occurred on day of admission Stage of treatment NR
Bauwens <i>et al.</i> , 2014 ³⁰	Pre-post	UP: May 2010 DB: period June 2010	Single	Oncology Centre of the University Hospital (UZ Brussel)	Belgium	To evaluate the impact of systematic screening with the DB on detection rates of patients with elevated distress and on rates of psychosocial referral compared with usual practice	(1) Ambulatory patients; (2) 18 years and older; (3) diagnosed with cancer; (4) sufficiently fluent in the languages of the study (Dutch or French); and (5) not affected by a cognitive disorder	UP: 278 DB period: 304	58.92 (13.03 SD)	32.0%	Breast 43.9%, lung 10%, colon 8.6%, prostate 3.4%, gynaecological 7.7%, skin 9.5%, brain 7.4%, other 9.5% Local disease 33%, locoregional disease 38.6%, advanced disease 28.4%	No treatment 24.3%, surgery 3.1%, RT 1.7%, chemotherapy 43.3%, medication 18.9%, RT+chemotherapy 2.1%, chemotherapy+medication 5.8%, RT+medication 0.7% Diagnosis 2.1%, active treatment curative intent 22.7%, active treatment palliative intent 53.0%, cured 9.8%, remission (partial/complete) 3.3%, palliative care 0.3%, wait and see 5.0%, recast recurrence 3.8%

DB, Distress Barometer; DT, Distress Thermometer; NCCH-E, National Cancer Center Hospital East; NR, not reported; PP, programme period; RT, radiotherapy; SIPP, Screening Inventory Psychosocial Problems; UP, usual care period.

Table 2 Definition of Effective Practice and Organisation of Care (EPOC) subcategories

EPOC subcategory	Definition
Educational materials	Distribution to individuals, or groups, of educational materials to support clinical care, that is, any intervention in which knowledge is distributed; for example, this may be facilitated by the internet, learning critical appraisal skills; skills for electronic retrieval of information, diagnostic formulation; question formulation
Educational meetings	Courses, workshops, conferences or other educational meetings
Educational outreach visits or academic detailing	Personal visits by a trained person to health workers in their own settings, to provide information with the aim of changing practice
Reminders	Manual or computerised interventions that prompt health workers to perform an action during a consultation with a patient, for example, computer decision support systems
Organisational culture	Strategies to change organisational culture
Continuous quality improvement	An iterative process to review and improve care that includes involvement of healthcare teams, analysis of a process or system, a structured process improvement method or problem-solving approach, and use of data analysis to assess changes

screening or referral.^{30 31} Thewes *et al*³¹ conducted a pre–post trial testing the feasibility and acceptability of introducing a routine psychological screening programme using the Distress Thermometer (DT) to improve screening rates and timeliness of referral to psychosocial services in three rural outpatient oncology clinics in Australia. Nursing and psychosocial staff participated in a 2-hour training session (educational meetings and educational materials) covering the rationale for screening, the screening instrument and the study procedure. The impact of the intervention on distress screening was not explicitly reported (ie, the control period rates of screening). Five of eight cases (according to predefined PSYCH-6 (psychological symptoms) cut-off criteria) and 10 of 19 cases (according to the DT cut-off) were referred to a social worker or psychologist in the control and intervention periods, respectively. Due to the small number of cases, significance testing of differences between the prescreening and screening phases was not conducted.

Bauwens *et al*³⁰ conducted a pre–post study to evaluate the impact of systematic screening with the Distress Barometer (DB) on detection rates of elevated distress and on rates of psychosocial referral at an oncology centre in Belgium. Oncologists were instructed in using the DB and given a written explanation (educational materials) on how to interpret the DB results in a collective 1-hour session (educational meetings). As this study did not aim to improve rates of distress screening, but focused on oncologist detection of distress and subsequent referral, all patients were screened using the DB in both conditions. Consequently, the rates of distress screening prior to the study, conducted by oncologists or other professional staff, compared with the study period, are unknown. In the usual care period, using oncologists' judgement, referral was considered necessary for 5.4% of all patients. In the DB condition, referral was considered necessary for 41.6% of all patients. Of those patients for whom referral was considered necessary, 40%

(6/15) in the usual care period and 69% (85/123) in the DB condition were actually referred to psychosocial care. The authors did not conduct an analysis to determine if there was a significant difference in these rates, however concluded that the implementation of screening using the DB led to increased numbers of referrals to psychosocial professionals.

Educational materials, educational meetings and outreach visits

Braeken *et al*^{26–28} conducted a cluster randomised controlled trial to study the effect of the implementation of the Screening Inventory Psychosocial Problems (SIPP) on the number and types of referrals of patients with cancer to psychosocial caregivers in a radiation oncology department in the Netherlands. Radiation oncologists were randomised to a control or intervention group. Those in the intervention group were trained by a researcher and two social workers with experience in using and interpreting the SIPP during a 1-hour training session (educational meetings, educational materials and educational outreach visits). The study found no significant intervention effects were observed for the total number of patients referred to psychosocial care providers at any of the assessment time points (first 3 months, the last 9 months and the total study period).

Educational materials, educational meetings, educational outreach visits and reminders

Ito and colleagues²⁵ conducted a pre–post trial to examine the usefulness of a screening programme (using the distress and impact thermometer; DIT) modified for patients with cancer undergoing radiotherapy at an outpatient cancer treatment centre in Japan. Prior to the screening phase, all pharmacists attended a 2-hour lecture and (educational meetings) given by a trained psychiatrist (who also met with the pharmacists monthly; educational outreach visits) and underwent role-play training to learn how to implement the DIT and referral for those patients

Table 3 Intervention description

Study	Healthcare providers	Distress screening tool	Referral criteria	Training	Intervention	Control/Comparison	EPOC subcategories
Thewes <i>et al</i> , ³¹ 2009	Nurses	DT, a single-item screening measure that identifies level and causes of distress. Respondents are asked to indicate their level of distress in the past week on an 11-point scale ranging from 0 ('None') to 10 ('Extreme').	Screening cohort: for individuals who scored above the cut-off score (≥ 5), nursing staff were encouraged to assess problems and concerns and explore the patient's interest in receiving referral to psychosocial staff using the skills and strategies discussed in the initial training session.	Nursing and psychosocial staff participated in a 2-hour training session covering the screening procedure and suggestions for how to discuss the results of screening with patients who scored above cut-off.	Distress screening was completed immediately before an initial oncologist rural clinic appointment or chemotherapy education session.	All participants completed the SPHERE-Short at baseline, a 12-item questionnaire measuring common psychological and somatic distress developed and validated in Australia. The SPHERE- Short has two subscales: PSYCH-6 and somatic symptoms. A score of ≥ 2 on the PSYCH-6 subscale indicates a likely case of psychological disorder.	Educational materials, educational meetings
Braeken <i>et al</i> , ²⁶ 2009, ²⁷ 2013, ²⁷ and 2013 ²⁸	Radiation oncologists	SIPP, a short, valid and reliable 24-item self-reported questionnaire that systematically identifies psychosocial problems in Dutch patients with cancer. Items are rated on a 3-point scale of 0 (no) to 2 (yes). Higher scores indicate poorer functioning.	Intervention: potential referral to a psychosocial caregiver was based on the scores of the SIPP in combination with the radiation oncologist's judgement. Control: according to the radiation oncologist's judgement about the presence or absence of psychosocial problems in patients	Before the start of the study, the radiation oncologists in the experimental condition were trained in using and interpreting the SIPP during a 1-hour training session. Training was given by the researcher and two social workers with experience in using and discussing the SIPP.	Patients received the SIPP just before the first and last consultation with the radiation oncologist. Psychosocial problems were discussed with the patient during the consultation, and referral to a psychosocial caregiver occurred only with the permission of the patient. The radiation oncologists were stratified according to general percentages of incoming patients they referred in 2006–2007 and then randomised to experimental or control condition.	Care as usual: no recent guidelines for the systematic assessment of psychosocial problems in patients with cancer existed at Institute Verbeeten. The radiation oncologist was able to refer patients to psychosocial caregivers (social workers) at Institute Verbeeten based on their clinical judgement.	Educational materials, educational meetings, educational outreach visits

Continued

Table 3 Continued

Study	Healthcare providers	Distress screening tool	Referral criteria	Training	Intervention	Control/Comparison	EPOC subcategories
Ito <i>et al</i> , 2011 ²⁵	Pharmacists	DIT, a two-item, self-administered rating scale Each 'distress' and 'impact' question is scored using an 11-point Likert scale, with scores ranging from 0 to 10 and a high score indicating an unfavourable status.	PP: if a patient scored equal to or more than each cut-off point (≥ 4 for distress and ≥ 3 for impact), the screening result was regarded as positive.	Before implementing the screening programme, all the pharmacists attended a 2-hour lecture given by a trained psychiatrist regarding the epidemiology, impact, risk factors, under-recognition and appropriate management of psychiatric disorders in patients with cancer. Additionally, the pharmacists underwent role-play training to learn how to implement the DIT and to give recommendations for psychiatric referral.	Pharmacists providing instructions to patients beginning chemotherapy at their first and second visits also provided information regarding the psychiatric service using a brief pamphlet and invited the patients to complete the DIT. The pharmacist then completed the screening programme sheet, which is a record of the patient's DIT scores. The pharmacist recommended a consultation with the psychiatric service to all the patients with a positive screening result and recorded the screening results on the medical chart.	UP was not described in detail.	Educational materials, educational meetings, educational outreach visits, reminders

Continued

Table 3 Continued

Study	Healthcare providers	Distress screening tool	Referral criteria	Training	Intervention	Control/Comparison	EPOC subcategories
Zemlin <i>et al</i> , 2011 ²⁹	BCNs and doctors	HADS: scores of more than 13 indicate clinically suspected psychological distress.	<p>Phase I: BCNs and doctors asked the patient about their interest in a psycho-oncological consultation where they felt necessary.</p> <p>Phase II: BCNs asked all patients about their interest in a psycho-oncological consultation on day of admission.</p> <p>Phase III: patients were referred to a psycho-oncological interview if (1) they scored >13 on the HADS; (2) the doctor had a clinical impression that the patient required referral; or (3) the patient desired referral.</p>	<p>Certified training courses for clinicians, gynaecologists and psychotherapists, as well as other professional groups of the inpatient and outpatient network were carried out.</p>	<p>In phase III, all patients completed the HADS questionnaire. The BCN evaluated the HADS and informed the patients about the possibility of a psycho-oncological initial interview. The BCN passed the evaluated HADS sheet to the physician. For those patients with psycho-oncological need (threshold HADS score and/or clinically suspected treatment-oriented psychological distress) the doctors recommended a psycho-oncological interview. Each patient with a desire for psycho-oncological care was logged and offered initial interview (regardless of HADS score).</p>	<p>In phase I, BCNs and doctors asked the patient about their interest in a psycho-oncological consultation where they felt necessary. In addition, all patients received information on psychosocial support options.</p>	<p>Organisational culture, continuous quality improvement, educational materials, educational meetings, reminders</p>

Continued

Table 3 Continued

Study	Healthcare providers	Distress screening tool	Referral criteria	Training	Intervention	Control/Comparison	EPOC subcategories
Bauwens <i>et al</i> , ³⁰ 2014	Seven oncologists	DB comprises three parts: (1) The DT (described above). The VAS was slightly adapted by using a background colour effect with anchors labelled 'no distress' through 'moderate distress' and 'extreme distress'. (2) The CCS consists of 10 items that are rated on a coloured 5-point scale. Patients are required to rate how much each of a list of sources of distress has been troubling them lately. (3) Additional Wish-Needs Questions: four additional questions regarding complaints and needs for further medical information and/or support	UP condition: oncologists used their own VAS assessment of distress to decide on an eventual referral, whereas in the DB condition the cut-off point for the DB (Distress Thermometer) ≥ 4 and elevated CCS was used by the oncologists for this purpose.	In a collective session held shortly before the DB condition, oncologists were instructed in using the DB and were given a written explanation on how to interpret DB results.	2-week period DB condition: the DB was administered before the consultation with the oncologist. Also in the DB condition, oncologists had a form with three other yes/no questions: (1) if they considered referral necessary, (2) if they actually gave an advice for referral and (3) if referral was accepted by patients.	2-week period UP condition: the DB was administered after the consultation with the oncologist. Also in the UP condition, oncologists had a form with four other questions: (1) their rating of patients' distress on a VAS (0–10), (2) if they considered referral necessary, (3) if they actually gave advice for referral and (4) if referral was accepted by patients.	Educational materials, educational meetings

BCN, breast care nurse; CCS, Colored Complaint Scale; DB, Distress Barometer; DIT, distress and impact thermometer; DT, Distress Thermometer; EPOC, Cochrane Effective Practice and Organisation of Care; HADS, Hospital Anxiety and Depression Scale; PP, programme period; PSYCH-6, psychological symptoms; SHPERE-Short, Somatic and Psychological Health Report Short form; SIPP, Screening Inventory Psychosocial Problems; UP, usual care period; VAS, Visual Analogue Scale.

Table 4 Primary outcomes

Study	Distress screening		Referral	
	Measure; data collection method	Results	Measure; data collection method	Results
Thewes <i>et al</i> , 2009 ³¹	Proportion of patients screened NR	Prescreening phase: proportion of patients screened (using any distress screening tool) was not reported. Screening phase: all patients were screened using the DT.	Proportion of patients referred in the prescreening phase compared with the screening phase Review of referral records and databases	Prescreening phase: of the 8 PSYCH-6 cases in the prescreening phase, 6 were referred to a CCC and 5 to a social worker/psychologist. Screening phase: 10/19 (53%) patients who met the DT cut-off were referred to a social worker or psychologist (11 of 14 PSYCH-6 cases were referred to the CCC and 8 to a social worker/psychologist).
Braeken <i>et al</i> , 2009, ²⁶ 2013 ²⁷ and 2013 ²⁸	Proportion of patients screened NR	Control group: proportion of patients screened (using any distress screening tool) was not reported. Intervention group: 263/268 (98%) were screened using the SIPP before the first consultation. 250/268 (96%) were screened using the SIPP before end of radiotherapy consultation.	The number of referrals of patients with psychosocial problems to psychosocial workers at Institute Verbeeten and/or to external healthcare providers (eg, psychologists, psychiatrists) Three dichotomous outcome variables (yes/no) during the first 3 months, the last 9 months and the total study period Measured at 3 and 12 months after baseline assessment with a self-developed questionnaire by the patient and from registration records of the psychosocial caregivers at Institute Verbeeten	First 3 months: control group 29/300 (9.7%) vs intervention group 34/268 (12.7%) patients referred (NS) Last 9 months: control group 24/300 (8%) vs intervention group 19/268 (7.1%) patients referred (NS) Group differences in these outcomes were analysed using generalised estimating equations with patients at level 1 and radiation oncologists at level 2. All models were adjusted for baseline differences with respect to gender and cancer diagnosis. Analyses were taken on an intention-to-treat principle. Generalised estimating equations found that numbers of referrals did not differ significantly between the intervention and control group at 3 months ($\beta=-0.16$, $SE\pm 0.34$, $P=0.32$), 9 months ($\beta=0.22$, $SE\pm 0.28$, $P=0.22$) or overall months ($\beta=-0.04$, $SE\pm 0.28$, $P=0.44$).
Ito <i>et al</i> , 2011 ²⁵	Proportion of patients screened NR.	UP: proportion of patients screened (using any distress screening tool) was not reported. PP: 441/520 (84.8%)	Proportion of patients referred to the psychiatric service and treated for MDD or AD among all the outpatients who had begun a new chemotherapy regimen within 3 months of their visit to the outpatient clinic Data extracted from patients' medical charts and the computerised database of the electronic medical record at NCCH-E	Retrospective cohort analysis (χ^2 test comparing patients treated during the PP with historical control data gathered during the UP) UP 5/478 (1.0%) vs PP 15/520 (2.7%) patients referred to the psychiatric service subsequently confirmed and treated for MDD or ADs ($P=0.46$)
Zemlin <i>et al</i> , 2011 ²⁹	Proportion of patients screened NR.	Proportion of patients screened in phase I or II screened (using any distress screening tool) was not reported. All patients in phase III were screened using the HADS.	Proportion of patients offered referral for psycho-oncological interview Medical records	Univariate data analysis Cochran-Armitage test Phase I 194/236 (82.2%) vs phase II 344/384 (89.6%) vs phase III 236/247 (95.5%) were informed/offered the psycho-oncological interview. There was a significant positive trend for the proportion of patients informed about the psycho-oncological care available ($t=22.40$, $df=2$, $P<0.001$).

Continued

Table 4 Continued

Study	Distress screening		Referral	
	Measure; data collection method	Results	Measure; data collection method	Results
Bauwens <i>et al</i> , 2014 ³⁰	Proportion of patients screened NR	UP condition: all patients were screened with the DB after consult with oncologist (therefore not used as part of the referral decision). DB condition: all patients were screened with the DB prior to consult with the oncologist.	Necessary referrals (UP condition: referrals necessary as per oncologists' VAS ratings; DB condition: referrals necessary for all patients with distress according to the DB) Self-assessment Referrals made (UP condition: proportion of patients for whom referral was considered necessary by the oncologists and were actually referred to psychosocial care; DB condition: proportion of patients with elevated distress who were referred) Self-assessment	UP condition: 13.8% of patients with elevated distress (or 5.4% of all patients); DB condition: 100% of patients with distress (or 41.6% of all patients) UP condition: 6/15 patients; DB condition: 85/123 patients

AD, adjustment disorder; CCC, cancer care coordinator; DB, Distress Barometer; DT, Distress Thermometer; HADS, Hospital Anxiety and Depression Scale; MDD, major depressive disorder; NCCH-E, National Cancer Center Hospital East; NR, not reported; NS, not significant.; PP, programme period; PSYCH-6, psychological symptoms; SIPP, Screening Inventory Psychosocial Problems; UP, usual care period; VAS, visual analogue scale.

scoring above the predetermined cut-off (educational materials). When providing instructions to patients beginning chemotherapy and at the second visit, pharmacists invited patients to complete the DIT and a screening programme sheet was completed by the pharmacists (reminders). The proportion of patients screened prior to the implementation of the screening programme using the DIT or other measure was not assessed, and 84.8% of patients were screened using the DIT in the intervention phase. The proportion of patients referred to the psychiatric service (and were subsequently confirmed to have major depression or adjustment disorder) during the screening programme

period compared with the usual care period was not significantly different between the two periods (2.7% during the programme period vs 1.0% during the usual care period; $P=0.46$).

Educational materials, educational meetings, reminders, organisational culture and continuous quality improvement

One study examined the effect of educational materials, educational meetings, reminders, organisational culture and continuous quality improvement on improvement in distress screening or referral. The trial by Zemlin *et al*²⁹ was a prospective consecutive study that aimed to integrate psycho-oncological early detection and diagnostics

Table 5 Secondary outcomes

Study	Measure; data collection method	Results
Braeken <i>et al</i> , 2009, ²⁶ 2013 ²⁷ and 2013 ²⁸	Extent of psychological symptoms at 3 months and 12 months after baseline Measured with the HADS and the GHQ-12 (assesses with 12 items whether the patient considers himself or herself better, the same, worse or much worse over the previous 4 weeks than he/she 'usually' is; total scores range from 0 to 12) Patients complete these self-reported questionnaires at baseline and at 3 and 12 months after the baseline period. Group differences in the proportion of dichotomous distress outcome (no or at least moderate distress) at 3 months and 12 months after baseline Measured with HADS and GHQ-12	Mixed effects modelling No significant intervention effects were observed for patients' extent of psychological distress (3 months after baseline mean psychological distress score control group 2.85 vs intervention group 2.74, $P=0.19$; 12 months after baseline mean psychological distress score control group 2.14 vs intervention group 1.96, $P=0.12$). Generalised estimating equations No significant intervention effects were observed for proportion of patients with distress (3 months after baseline control group 39% vs experimental group 38.4%, $P=0.036$; 12 months after baseline control group 24.7% vs intervention group 24.3%, $P=0.39$).

GHQ-12, Goldberg's General Health Questionnaire-12 item version; HADS, Hospital Anxiety and Depression Scale.

Table 6 Ratings of methodological quality: strong, moderate and weak

Study	Selection bias	Study design	Confounders	Blinding	Data collection	Withdrawals	Global rating
Thewes <i>et al</i> , 2009 ³¹	Moderate	Moderate	Weak	Moderate	Weak	Moderate	Weak
Braeken <i>et al</i> , 2009, ²⁶ 2013 ²⁷ and 2013 ²⁸	Moderate	Strong	Strong	Moderate	Weak	Strong	Moderate
Ito <i>et al</i> , 2011 ²⁵	Moderate	Moderate	Strong	Moderate	Weak	Moderate	Moderate
Zemlin <i>et al</i> , 2011 ²⁹	Moderate	Moderate	Weak	Moderate	Weak	Moderate	Weak
Bauwens <i>et al</i> , 2014 ³⁰	Moderate	Moderate	Weak	Weak	Weak	Weak	Weak

as an integral part of everyday practice routines of acute inpatient care within the multidisciplinary diagnosis and care chain of patients with breast cancer at a gynaecology clinic in Germany. Prior to the introduction of the programme, certified training courses were held for clinicians, gynaecologists and psychotherapists, as well as other professional groups (educational meetings, educational materials, organisational culture), and every 3–4 months cross-departmental meetings between psychology and gynaecology departments were held (continuous quality improvement). The authors described the trial in three phases: in phase I, breast care nurses and doctors asked the patient about their interest in a psycho-oncological consultation where they felt necessary, and in phase II the nurses asked this of patients on the day of their admission. In phase III, the nurses conducted screening using the Hospital Anxiety and Depression Scale (HADS) with all patients and passed the HADS sheet to the physician (reminders). A predetermined cut-off indicated if referral was required. The proportion of patients screened with the HADS during phase III was 100%. The proportion of patients screened in phase I or II using the HADS or other measure was not assessed. The authors reported a significant positive trend for the proportion of patients offered referral for psycho-oncological care between phases I and III ($t=22.40$, $df=2$, $P<0.001$).

Secondary outcomes

Psychosocial distress

Only one study compared patients' levels of distress at follow-up using the distress screening measure implemented. Braeken *et al*^{26–28} found no significant intervention effects as measured by the HADS for patients' psychological distress at 3 months or 12 months after baseline, nor dichotomous distress outcomes (no distress or at least moderate distress) at 3 months or 12 months after baseline.

Reported adverse consequences

No study explicitly assessed whether the intervention had adverse effects.

Quality of the evidence

Using GRADE, the overall rating of the certainty of the body of evidence reported in this review was assessed as very low. The primary outcomes examined were

downgraded one level to reflect high risk of bias and further downgraded two levels due to clinical heterogeneity and inconsistency in reporting either rates of distress screening or referral across both control and intervention periods. Since indirectness and imprecision also lower the quality of the evidence, we downgraded two further levels on that basis. We found the quality of evidence to be of weak to moderate quality due to risk of bias using the EPHP (table 6), which identified a number of limitations, particularly among the pre–post studies in regard to controlling for potential confounders.

DISCUSSION

This review sought to assess the impact of trials of strategies to improve clinician provision of screening of patients with cancer for psychosocial distress, and referral for further assessment and/or psychosocial support where necessary. The review identified just one trial that met the prospectively registered inclusion criteria of having a parallel control trial design. When these criteria were relaxed to include those with a non-parallel control group, a further four trials were included. Largely due to study designs (ie, mostly pre–post), none of the included studies were able to provide quality evidence for the effectiveness of screening procedures in improving rates of distress screening. The intervention in just one trial was effective in significantly improving the rates of referral for psycho-oncological support for distressed patients. Such findings highlight the sparse evidence base for this important element of care for patients with cancer, and leave health services and cancer professionals with little clear guidance of strategies to improve provision of these elements of care to their patients.

Our findings are consistent with previous systematic reviews of trials aiming to improve depression or anxiety screening in primary care that have found that improvement in care provision is more likely when complex organisational change strategies are used, such as coordination between departments, enhanced role of nurses and performance feedback, in addition to clinician education.^{13–15} The findings of the review highlight that the implementation of routine psychosocial screening and referral in cancer is complex and more rigorous research is needed. The trial by Zemlin *et al*²⁹ was the only study

included in the review to adopt a comprehensive implementation approach, and the only study to report significant improvement in offer of referral of patients with cancer for distress. Implementation strategies employed by other trials were primarily based on one-off training and resource provision, suggesting that such support is insufficient. Comprehensive implementation strategies may be more likely to improve care given their greater capacity to address various barriers to screening and referral. Interestingly, Zemlin *et al*²⁹ was the only study to describe strategies employed to change the organisational culture of the healthcare setting, specifically defining responsibilities and tasks between the specialist disciplines and the medical and nursing staff involved in the treatment team, training certificates, as well as regular meetings to facilitate communication. It may be that simpler interventions are less effective in implementing routine provision of this care because they fail to address the organisational culture of the setting. Strengthening team communication²⁵ and making clinicians more aware of their role and responsibilities in distress screening and referral for patients with cancer²⁷ may improve the rates of this care delivery. Further research identifying the key barriers to such care and the best strategies to address them in cancer services is therefore warranted.

Surprisingly, none of the included studies examined the impact of strategies employed (eg, training) to improve the rate of clinician provision of psychosocial distress screening. Due to the majority of study designs not employing a parallel comparison group, the review does not provide quality evidence regarding the effectiveness of implementation strategies to improve screening or referral. Such a finding is of concern. Screening is a necessary prerequisite to appropriate referral of patients with cancer to psychological support. As screening for psychosocial distress in cancer populations is low across jurisdictions,³² improving this form of care should represent a priority. Previous studies have used novel technologies to prompt screening by clinicians.^{33–35} Such approaches should be examined in robust trial designs in cancer settings that allow for their impact on improving the rate of routine clinician provision of distress screening to be determined.

A number of methodological aspects of the study warrant highlighting and should be considered when interpreting the study findings. As far as the authors are aware, this is the first systematic review to examine the impact of interventions of strategies to improve the rate of clinician provision of distress screening and appropriate referral in patients with cancer. The review was prospectively registered, followed a peer-reviewed protocol and included a comprehensive search strategy examining over 18000 citations. There was substantial clinical and methodological heterogeneity in the included studies. Classification of EPOC taxonomy implementation strategies was also difficult due to the lack of detail reported on intervention components in the studies. Furthermore, only one of the studies was a randomised controlled trial.

Such characteristics of the included studies precluded quantitative synthesis of the effects of these strategies.

CONCLUSIONS

The findings of this review suggest that there is considerable scope to improve implementation of psychosocial distress screening and referral in cancer settings in order to establish a strong evidence base for future successful interventions. Implementation of psychosocial distress screening and appropriate referral needs to be employed using a systematic method and assessed with appropriately controlled studies in order to determine the most effective approaches. Better reporting of outcomes and more detailed description of intervention components need to be prepared.

Contributors KM and LW conceptualised the review with input from BB, ALB, SAH, AKB, GC, CW, JB, DB and EF. KM and EF conducted screening, data extraction and methodological quality analysis. KM and LW drafted the manuscript. All authors contributed to subsequent drafts and have approved the final version of the manuscript.

Funding This work was supported by a Hunter Cancer Research Alliance Implementation Flagship Program grant.

Competing interests None declared.

Provenance and peer review Not commissioned; externally peer reviewed.

Data sharing statement No additional data available.

Open Access This is an Open Access article distributed in accordance with the Creative Commons Attribution Non Commercial (CC BY-NC 4.0) license, which permits others to distribute, remix, adapt, build upon this work non-commercially, and license their derivative works on different terms, provided the original work is properly cited and the use is non-commercial. See: <http://creativecommons.org/licenses/by-nc/4.0/>

© Article author(s) (or their employer(s) unless otherwise stated in the text of the article) 2018. All rights reserved. No commercial use is permitted unless otherwise expressly granted.

REFERENCES

1. National Comprehensive Cancer Network. *NCCN clinical practice guidelines in oncology: distress management*, 2017.
2. Ma L, Poulin P, Feldstain A, *et al*. The association between malnutrition and psychological distress in patients with advanced head-and-neck cancer. *Curr Oncol* 2013;20:554–60.
3. Holland JC, Alici Y. Management of distress in cancer patients. *J Support Oncol* 2010;8:4–12.
4. Bultz BD, Carlson LE. Emotional distress: the sixth vital sign--future directions in cancer care. *Psychooncology* 2006;15:93–5.
5. Jacobsen P, Donovan K, Swaine Z, *et al*. Management of anxiety and depression in adult cancer patients: toward an evidence-based approach. In: Chang A, Ganz P, Hayes D, Kinsella T, Pass H, . eds. *Oncology: an evidence-based approach*. New York: Springer-Verlag, 2006:1552–79.
6. Barsevick AM, Sweeney C, Haney E, *et al*. A systematic qualitative analysis of psychoeducational interventions for depression in patients with cancer. *Oncol Nurs Forum* 2002;29:73–87. quiz 5-7.
7. Osborn RL, Demoncada AC, Feuerstein M. Psychosocial interventions for depression, anxiety, and quality of life in cancer survivors: meta-analyses. *Int J Psychiatry Med* 2006;36:13–34.
8. Andrykowski MA, Manne SL. Are psychological interventions effective and accepted by cancer patients? I. Standards and levels of evidence. *Ann Behav Med* 2006;32:93–7.
9. Meijer A, Roseman M, Delisle VC, *et al*. Effects of screening for psychological distress on patient outcomes in cancer: a systematic review. *J Psychosom Res* 2013;75:1–17.
10. Mitchell AJ. Screening for cancer-related distress: when is implementation successful and when is it unsuccessful? *Acta Oncol* 2013;52:216–24.

11. Jacobsen PB, Ransom S. Implementation of NCCN distress management guidelines by member institutions. *J Natl Compr Canc Netw* 2007;5:99–103.
12. American College of Surgeons Commission on Cancer. *Cancer program standards 2012 version 1.2.1: ensuring patient-centered care*, 2012.
13. Hermanns N, Caputo S, Dzida G, *et al.* Screening, evaluation and management of depression in people with diabetes in primary care. *Prim Care Diabetes* 2013;7:1–10.
14. Gilbody S, Whitty P, Grimshaw J, *et al.* Educational and organizational interventions to improve the management of depression in primary care: a systematic review. *JAMA* 2003;289:3145–51.
15. Heideman J, van Rijswijk E, van Lin N, *et al.* Interventions to improve management of anxiety disorders in general practice: a systematic review. *Br J Gen Pract* 2005;55:867–73.
16. Moher D, Liberati A, Tetzlaff J, *et al.* Preferred reporting items for systematic reviews and meta-analyses: the PRISMA statement. *J Clin Epidemiol* 2009;62:1006–12.
17. McCarter K, Britton B, Baker A, *et al.* Interventions to improve screening and appropriate referral of patients with cancer for distress: systematic review protocol. *BMJ Open* 2015;5:e008277.
18. Effective Practice and Organisation of Care (EPOC). *EPOC taxonomy*, 2015.
19. Ostuzzi G, Matcham F, Dauchy S, *et al.* Antidepressants for the treatment of depression in people with cancer. *Cochrane Database Syst Rev* 2015:CD011006.
20. Vodermaier A, Linden W, Siu C. Screening for emotional distress in cancer patients: a systematic review of assessment instruments. *J Natl Cancer Inst* 2009;101:1464–88.
21. Akbari A, Mayhew A, Al-Alawi MA, *et al.* Interventions to improve outpatient referrals from primary care to secondary care. *Cochrane Database Syst Rev* 2008;4:CD005471.
22. Bower P, Knowles S, Coventry PA, *et al.* Counselling for mental health and psychosocial problems in primary care. *Cochrane Database Syst Rev* 2011:CD001025.
23. Higgins JP, Green S. *Cochrane handbook for systematic reviews of interventions*. Wiley Online Library, 2008.
24. Armijo-Olivo S, Stiles CR, Hagen NA, *et al.* Assessment of study quality for systematic reviews: a comparison of the cochrane collaboration risk of bias tool and the effective public health practice project quality assessment tool: methodological research. *J Eval Clin Pract* 2012;18:12–18.
25. Ito T, Shimizu K, Ichida Y, *et al.* Usefulness of pharmacist-assisted screening and psychiatric referral program for outpatients with cancer undergoing chemotherapy. *Psychooncology* 2011;20:647–54.
26. Braeken AP, Lechner L, van Gils FC, *et al.* The effectiveness of the Screening Inventory of Psychosocial Problems (SIPP) in cancer patients treated with radiotherapy: design of a cluster randomised controlled trial. *BMC Cancer* 2009;9:177.
27. Braeken AP, Lechner L, Eekers DB, *et al.* Does routine psychosocial screening improve referral to psychosocial care providers and patient-radiotherapist communication? A cluster randomized controlled trial. *Patient Educ Couns* 2013;93:289–97.
28. Braeken AP, Kempen GI, Eekers DB, *et al.* Psychosocial screening effects on health-related outcomes in patients receiving radiotherapy. A cluster randomised controlled trial. *Psychooncology* 2013;22:2736–46.
29. Zemlin C, Herrmann-Lingen C, Wiegand K, *et al.* Implementation of a computer and screening-based psycho-oncological clinical pathway. *Geburtshilfe und Frauenheilkunde* 2011;71:853–61.
30. Bauwens S, Baillon C, Distelmans W, *et al.* Systematic screening for distress in oncology practice using the Distress Barometer: the impact on referrals to psychosocial care. *Psychooncology* 2014;23:804–11.
31. Thewes B, Butow P, Stuart-Harris R. Greater Southern Area Health Service Screening Collaborative Group. Does routine psychological screening of newly diagnosed rural cancer patients lead to better patient outcomes? Results of a pilot study. *Aust J Rural Health* 2009;17:298–304.
32. Lazenby M, Ercolano E, Grant M, *et al.* Supporting commission on cancer-mandated psychosocial distress screening with implementation strategies. *J Oncol Pract* 2015;11:e413–20.
33. Wolfenden L, Wiggers J, Knight J, *et al.* Increasing smoking cessation care in a preoperative clinic: a randomized controlled trial. *Prev Med* 2005;41:284–90.
34. Wolfenden L, Wiggers J, Campbell E, *et al.* Feasibility, acceptability, and cost of referring surgical patients for postdischarge cessation support from a quitline. *Nicotine Tob Res* 2008;10:1105–8.
35. Dexheimer JW, Talbot TR, Sanders DL, *et al.* Prompting clinicians about preventive care measures: a systematic review of randomized controlled trials. *J Am Med Inform Assoc* 2008;15:311–20.