

Review

# Psychosocial telephone interventions for patients with cancer and survivors: a systematic review

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## Abstract

**Objective:** Over one third of patients with cancer experience elevated psychosocial distress. As screening for distress becomes more common, the number of patients referred for psychosocial care will increase. Psychosocial telephone interventions are recommended as a convenient and exportable alternative to in-person interventions addressing psychosocial distress. This study reviews the efficacy of randomized controlled trials (RCTs) of psychosocial telephone interventions for patients with cancer.

**Methods:** We conducted a systematic review of peer-reviewed RCTs evaluating telephone interventions in adult patients with cancer across the survivorship continuum.

**Results:** Through a database search, 480 articles were identified. After manual review, 13 were included, with 7 additional studies identified by back citation, totaling 20 studies. Participants were largely Caucasian, highly educated, with mean age ranging from 49 to 75 years. Most participants were patients with breast cancer ( $n = 13$  studies). Sample sizes were generally small, with most patients recruited from large medical centers. Only one screened for psychosocial need. Interventions varied greatly in length and intensity. Eight studies reported significant effects post-intervention in the hypothesized direction on at least one psychosocial outcome measure. Of these eight studies, four included more than one follow-up assessment; of these, only one reported significant effects at last follow-up. No clear commonalities were found among studies reporting significant effects.

**Conclusions:** Methodological concerns and lack of consistency in adherence to CONSORT reporting guidelines were identified. This body of research would benefit from well-designed, theory-based RCTs adequately powered to provide more definitive evidence for intervention efficacy. This will probably require multi-institutional collaborations, guided by intervention and research methodology best practices.

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## Background

Cancer diagnosis and treatment constitute a major life disruption that brings unique challenges throughout the survivorship continuum, resulting in elevated levels of psychosocial distress in more than one third of patients [1–3]. This distress is not limited to the initial diagnosis and active-treatment phases but is also prevalent post-treatment [4]. Elevated psychosocial distress is associated with poor health status, low adherence to treatment recommendations, increased reports of pain and fatigue, as well as anxiety and depression [5–8]. Given the magnitude of patients with cancer and survivors in the USA alone [9–12], the psychosocial concerns associated with cancer diagnosis, treatment and survivorship constitute a major challenge.

In response to the burden of distress experienced by many patients with cancer and survivors, the American College of Surgeons (ACoS) Commission on Cancer has mandated distress screening and referral to psychosocial care as a condition of cancer program accreditation starting in 2015 [13]. It is

anticipated that this ACoS mandate will substantially increase the number of patients with cancer who will be referred for psychosocial care. Accordingly, there is an urgent need to assess the science of evidence-based psychosocial oncology programs that will respond to the identified elevated distress.

Recognized for their efficacy in improving quality of life and ameliorating distress in patients with cancer, psychosocial oncology interventions have been the subject of several meta-analyses and systematic reviews [3,14–21]. In the most recent one, Faller *et al.* included 198 randomized controlled trials (RCTs) covering 22,238 patients. This meta-analysis was limited to in-person psychosocial interventions, where small to medium effects on emotional distress, anxiety, depression and health-related quality of life (HRQOL) were found. The observed benefits for some were sustained in medium and long-term follow-up, particularly for longer duration of interventions. Unfortunately, all reviews agree about similar shortcomings in this area of research—that they are mostly concentrated in the active treatment phase with a disproportionate focus

on breast cancer and limited by poor reporting, low methodological quality and measurement challenges [3,19,20,22].

Evidence also suggests that psychosocial interventions delivered through the telephone, a recommended modality for psycho-educational support to patients with cancer and survivors for over 25 years, may be efficacious [7,14–18,23–25]. Telephone counseling interventions have been found to improve health behaviors such as physical activity, dietary behavior change and smoking cessation [26–29]. Convenient and exportable, telephone interventions transcend geographic barriers and do not require a return visit to the treatment institution [7]. Because one third of patients or more decline to participate in in-person interventions, telephone interventions may be an appropriate alternative [18]. This modality may provide a cost-effective way to deliver psychosocial care in compliance with the ACoS mandate [7,17]. The present study is the first review to solely examine the efficacy of telephone interventions in over a decade. A 1998 review of telephone psychosocial support in patients with cancer reported that telephone interventions are feasible and acceptable but that too few studies had been conducted to report generalizable results (only three eligible studies were randomized controlled trials) [18].

This review examined all published RCTs of psychosocial telephone interventions tested in patients with cancer throughout the cancer care continuum [7,30–48]. Each RCT is described in terms of its research setting, populations studied, research and intervention methodology, as well as the main findings obtained from the primary end points in each trial. Finally, based on this review, recommendations for future research are provided to advance the science of telephone interventions in psychosocial oncology.

## Methods

Methods reported herein are in accordance to the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) statement [49]. Inclusion criteria and analysis were specified and agreed upon in advance.

### Eligibility criteria

Following the participants, interventions, comparators, outcomes, and study design (PICOS) framework [50], the following eligibility criteria were considered:

#### Patient population

Adults age 18 or older with a cancer diagnosis at any point across the cancer survivorship continuum, including diagnosis, in-treatment, immediately post-treatment and long-term survivorship.

#### Intervention

Telephone psychosocial intervention, defined as a non-pharmacologic intervention, where the description of the intervention included at least some evidence of interactive counseling techniques, approaches or protocols to help patients normalize and/or cope with and respond to their psychosocial sequelae, including anxiety, distress, depression, feelings of uncertainty and fear of recurrence, as well as other related psychosocial concerns. The intervention structure is briefly described, but the reader is encouraged to refer back to the original citation for more specific details, such as the theory underlying the intervention. Studies in which the intervention was not explained enough to ascertain whether counseling, as defined in the preceding texts, was provided were excluded [51]. Otherwise, studies were included if intervention staff provided interactive social support to normalize the psychosocial concerns of patients with cancer and survivors. Studies that used a combination of a primarily in-person or multimedia (such as CD-ROM) counseling intervention, and those studies that used the telephone only as an adjunct for follow-up or reinforcement and not as primary mode of intervention delivery, were excluded [52–54]. Telephone interventions that focused mainly or exclusively on promoting medical follow-up or clinical case management were excluded [55,56]. Although few in number, such studies shared a different research or service-delivery objective, that the telephone intervention did not specifically or directly address the psychosocial concerns of patients with cancer. In addition, telephone intervention studies that focused mainly on promoting physical activity, healthy diet and nutrition practices or other healthy lifestyle behaviors among patients with and survivors were similarly excluded [57–60].

#### Comparator group

Comparator group could be usual care, attention control or other psychosocial counseling or intervention modalities.

#### Outcomes

Primary outcomes evaluated in this review included global assessments of HRQOL, if such assessments also included psychosocial functioning, as well as content-specific psychosocial assessments. Subscales that assessed psychosocial functioning were also abstracted and reported. Statistically significant changes were defined by a  $p$ -value of  $p < 0.05$ . Many of the studies included in this review also reported differences by experimental condition on selected intermediate outcomes or mediator variables (e.g. use of different coping strategies). However, as noted above, this review focuses only on the primary or secondary psychosocial or HRQOL end points, as identified by the authors. Similarly, this review does not include or

summarize findings related to patient-reported satisfaction or other non-psychosocial end points such as symptoms.

### Study design

Only RCTs published in peer-reviewed journals from 1966 until March 2013 were included. Abstract-only reports were excluded. Several studies produced multiple publications that reported the same data or outcomes from the same study. When this occurred, only one of these studies was included in this review [48,61–63].

### Information sources and search

Studies were initially identified by electronic database search, including PubMed, CINAHL, PsycINFO and Web of Science. Keywords included were ‘hotline, telephone counseling, telecare, cancer, neoplasm’, and excluded ‘smoking, tobacco’ in order to avoid retrieval of the numerous telephone smoking cessation interventions published. The search was last updated on March 18, 2013. The study author S.O. performed all searches.

In addition to the database search, studies were subsequently identified by scanning reference lists, and finally by consultation with experts in the field. Retrieval of missing data was obtained by email contact to the corresponding author [64].

### Study selection

All study titles and abstracts were reviewed by one of the authors, excluding those that were clearly not relevant. Remaining studies’ full-text publications were obtained and discussed as a group. Disagreements about a study’s inclusion or exclusion were discussed as a group, and decisions were made based upon consensus.

### Data collection process

We developed a data abstraction form based on the information of interest to be extracted. This form was pilot-tested with five randomly selected studies and was refined accordingly. Data was extracted as a group during in-person meetings in order to promote discussion and learning. Any disagreements were resolved by group discussion.

### Data items

The information extracted from each study included the following: (1) setting or environment from which participants were recruited, (2) general study design, (3) number of participants in intervention and comparator groups, (4) participation (based on eligible patients) and retention rates, (5) eligibility criteria for study participation, (6) description of the telephone intervention(s), including who delivered it, duration, number and frequency of sessions, length of calls, (7) description of the comparator condition(s), (8) primary psychosocial outcome measures, (9)

timing of outcome assessments related to the intervention, (10) summary of primary psychosocial outcome findings.

### Assessment of risk of bias

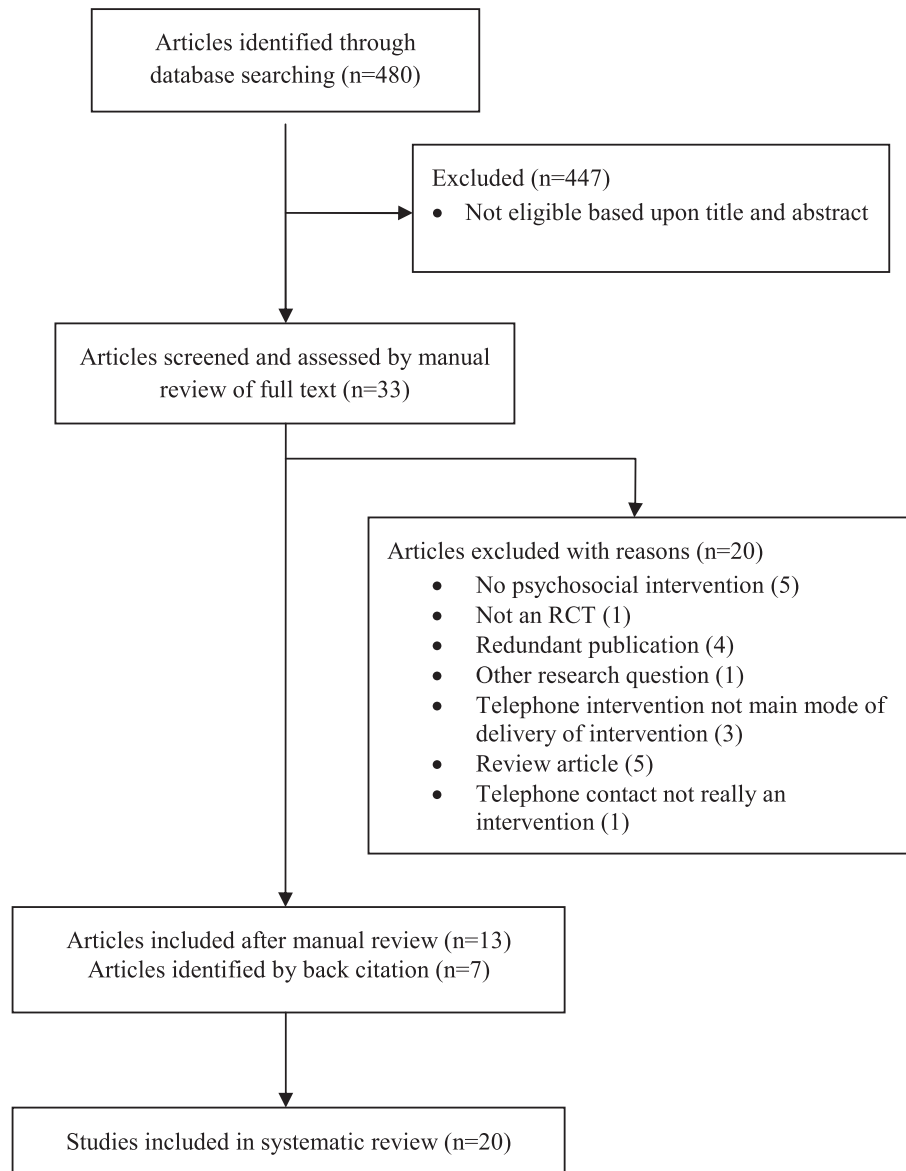
To ascertain the validity of eligible randomized trials, the study authors as a group evaluated each study according to the CONSORT 2010 guidelines [50].

### Results

A total of 20 studies were identified for inclusion in this review, covering 3848 patients. The search of PubMed provided a total of 480 citations. Other databases queried did not provide any additional citations to the ones previously identified. Of these, 447 citations were excluded based on the evaluation of titles and abstracts because they were clearly not relevant. Thirty-three full-text articles were assessed in further detail. Twenty did not meet inclusion criteria as described in Figure 1. Scanning reference lists of included studies and review articles subsequently identified seven additional studies.

Characteristics of the study designs, participants and interventions for each of the 20 RCTs can be found in Table 1. Over half of the RCTs featured usual care (including enhanced usual care) as the comparator group. Other studies used attention control or telephone education as a comparison. Participants were largely Caucasian, highly educated, married, and the mean age of participants in each study ranged from 49 to 75 years of age. Most participants were patients with breast cancer ( $n = 13$  studies), newly diagnosed with early stage disease and were recruited from large hospitals including multi-site clinics and academic medical centers. Other cancer types included prostate ( $n = 3$ ), cervical ( $n = 2$ ) and a combination of cancers ( $n = 2$ ). Eligibility criteria typically included no major comorbidities (including but not limited to psychiatric conditions), ability to speak English, early stage disease and recent diagnosis (or, in a smaller number of studies, recent completion of treatment). Three studies focused on the re-entry phase alone [7,31,44] while one focused on watchful waiting for prostate cancer [35] and another on long-term survivorship [43]. Only one screened on the basis of psychosocial need, showing positive intervention effects [31].

Most studies reported a guiding theoretical framework and/or specific counseling technique ( $n = 18$ ) such as uncertainty in illness theory, the stress and coping model, interpersonal psychotherapy or cognitive behavioral therapy. Only two interventions did not specify a theory or technique. Interventions were largely delivered by nurses ( $n = 11$ ) but also included graduate psychology students, social workers, trained oncology counselors and cancer survivors as peer counselors. Interventions were mainly delivered during treatment ( $n = 8$ ) or during



**Figure 1.** Flow diagram depicting the systematic review process

treatment and/or re-entry ( $n=7$ ). Duration of counseling varied from two telephone sessions to 20 calls over 13 months, with over half ( $n=12$ ) falling into the 5 to 8 call range. Total dose ranged from 65 to 720 min. Frequency of calls was weekly for nearly half of the studies, while others featured other intervals. Sample sizes were generally small, ranging from 23 to 571 participants overall and from 8 to 209 individuals per intervention arm. Nearly half of studies ( $n=9$ ) had an overall sample of 100 or less. A wide variety of end points were used, most common including quality of life (FACT-G, QOL-CS, QOL-BC, CARES-SF, EORTC QOL-C30, QOL-BR23) and mood/affect (POMS, POMS-SF, PANAS), depression (CES-D, HADS) and anxiety (STAI, HADS). Other end points included social

support (IPRI-SF, PSS-FA), stress (ICS, PPS), distress (IES), physical and mental health (SF-12), psychological growth (GTUS), psychosocial adjustment (PAIS-SR), fear of recurrence (FR), and resource use (RU).

Nine studies had a statistically significant effect on at least one psychosocial outcome measure at any time point in the hypothesized direction (main effect or other measure), eight of which had a significant effect when measured after completion of the intervention [7,30–32,35,44–46]. Four of these eight studies measured outcomes beyond the immediate post-intervention, and only one demonstrated sustained significant effects at the end of the follow-up period [7]. No commonalities were identified for the nine studies with significant findings.

Table 1. Descriptive summary of included studies by author

Reference	Study design setting	Eligibility criteria	Telephone psychosocial intervention	Comparator	Primary outcomes, timing of measurements	Primary psychosocial outcome findings
Allard 2007	Two-group RCT, intervention (n = 61) versus control (n = 56)  Five regional medical centers, urban and rural, Quebec, Canada	Breast cancer diagnosis/suspected lesion, scheduled to undergo outpatient breast surgery, French speaking	Two calls, 1 week apart over 3 weeks, delivered by nursing professor  Call length: variable depending on patient needs  Duration: 2–3 weeks	Usual care, additional call by research assistant, call length: not specified	POMS total score and anger, depression, confusion and anxiety subscales  Assessments: T0: baseline (2–3 days after surgery), T1: 9–10 days after surgery, following the first session, and T2: 17–18 days after surgery, following second session	Significant group differences favoring intervention group for POMS total score in hypothesized direction at T1 but not T2  No significant group-by-time interaction
Ashing-Giwa 2008	64% PR, RR not reported Two-group RCT, intervention (n = 15) versus control (n = 8)	Latina women 1–3 years after completion of cervical cancer treatment (stage I–III), self-identified as Latina, at least moderate concerns on FACT-Cx emotional well-being subscales	Six total calls, 1–2 week intervals, initial call 1 h, all others 30–40 min, delivered by graduate psychology students  Duration: 3 months	Survivorship kit	FACT-G total score, and physical, social/family, emotional, and functional well-being subscales	No direct comparison between groups
Badger 2007	Selected from previous cohort study from state and hospital cancer registries PR not reported, 100% RR  Three-group RCT of patient/partner dyads to two interventions: telephone interpersonal counseling (TIP-C, n = 38), self-management exercise intervention (EI, n = 23) versus attention control (AC, n = 37)  Academic cancer center, private oncology offices	Breast cancer, stages I–III, undergoing adjuvant treatment, available partner	TIP-C: six weekly calls, mean 34 min, delivered by psychiatric nurse with oncology expertise  Duration: 6 weeks	EI: self-managed exercise protocol, six weekly calls encouraging exercise, mean 11 min  AC: printed breast cancer information, six weekly calls without counseling, mean 7 min	CES-D, composite anxiety score based on items from PANAS, SF-12, ICS  Assessments: T0: baseline, T1: immediately post-intervention	Significant improvements in intervention group for FACT physical and overall scores No significant differences for the control group  No significant group-by-time interaction for CES-D. Significant group effect for TIP-C and EI over the course of the study

(Continues)

Table 1. (Continued)

Reference	Study design setting	Eligibility criteria	Telephone psychosocial intervention	Comparator	Primary outcomes, timing of measurements	Primary psychosocial outcome findings
Badger 2011	84% PR, 94% RR Two-group RCT of patient/ partner dyads, intervention (n = 36) versus control (n = 35)	Males with prostate cancer; undergoing or completed treatment within 6 months, available partner	Eight weekly calls, mean 31 min, delivered by master's prepared nurse or social worker  Duration: 8 weeks	Health information without counseling, eight weekly calls, initial call mean 59 min, all other calls mean 28 min, delivered by paraprofessionals or research assistant students	CES-D, PANAS, PSS, QOL- CS social well-being subscale, PSS-Fa, QOL- BC, spiritual well-being subscale  Assessments: T0: baseline, T1: immediately post- intervention, T2: 8 weeks post-intervention	with AC; Post hoc analyses revealed group-by-time interaction confined to the T0-T1 comparisons for TIP-C and EI  Significant group differences favoring attention control group in four psychosocial outcomes: depression, negative effect, perceived stress and spiritual well- being; over the course of the study
Badger 2012	Recruitment from VA regional cancer center; cancer support groups and oncology offices 39% PR, 90% RR Two-group RCT of patient/ partner dyads, intervention (n = 45) versus control (n = 45)	Latina women, stage I-III breast cancer, receiving adjuvant treatment, English or Spanish speaking, available partner	Eight weekly calls (four biweekly calls for partners) mean 29 min, delivered by bilingual, bicultural master's-level social worker  Duration: 8 weeks	Mailed health education materials reviewed via telephone, eight biweekly calls (four biweekly calls for partners) mean 29 min, delivered by bilingual, bicultural paraprofessionals	CES-D, PANAS, PSS, STAI  Assessments: T0: baseline, T1: immediately post- intervention, T2: 8 weeks post-intervention	No significant differences between groups, with both groups showing significant improvement over time
Bailey 2004	Cancer center, oncologists' offices, support groups, self-referral  50% PR, 78% RR Two-group RCT, intervention (n = 20) versus control (n = 19)	Stages B1, B2, or C1 prostate cancer, who elected watchful waiting	Five weekly calls, mean 13 min, delivered by nurse interventionist  Duration: 5 weeks	Usual care	GTUS, POMS-SF, Cantril's ladder  Assessments: T0: baseline, T1: immediately post- intervention, T2: 8 weeks post-intervention	Significant differences in the intervention group in the hypothesized direction for the GTUS subscale 'new view of life' and QOL at T1
Crane-Okada 2012	Central North Carolina hospital urology practice 75% PR, 95% RR Three-group block randomized design, immediate contact (IC, n = 50), delayed contact	New diagnosis of stage I-III breast cancer, scheduled for surgery, age 50+	IC: five calls; 72 h before surgery—week 5 post- surgery	UC: usual care. No peer counseling unless requested. If requested, re-assigned to IC or DC depending on timing	HADS, IPRI-SF, FOR, RU (assessed at 6 months only)	No significant main or interaction effects (time or intervention) for HADS, IPRI-SF

<p>(DC, n = 46) or control (UC, n = 46) Community, hospital-based breast surgical oncology practice affiliated with cancer research institute, Los Angeles, CA</p>	<p>DC: Five calls, week 6–10 post-surgery  Mean 15 min, delivered by trained volunteer peer counselors Call length: not specified by group Duration: roughly 5 weeks Five or more calls, no set interval between calls, delivered by trained nurses</p>	<p>Assessments: T0: baseline, T1: immediately post-intervention, T2: 6 months post-baseline</p>	<p>of request. Analysis proceeded as treated.</p>	<p>Usual care</p>	<p>CES-D, PAIS-SR</p>	<p>No significant group differences</p>
<p>Downe-Wamboldt 2007  44% PR, 98% RR Two-group RCT, intervention (n = 89) versus control (n = 86)</p>	<p>Newly diagnosed lung, breast or prostate cancer, age 50+, surgery within past 3 months, living within 200 km of clinic, no chemotherapy</p>	<p>CES-D, PAIS-SR</p>	<p>Usual care</p>	<p>CES-D, PAIS-SR</p>	<p>No significant group differences</p>	
<p>Canadian academic medical center; private offices of surgeons 66% PR, 85% RR Two-group RCT, intervention (n = 153) versus control (n = 152)</p>	<p>First recurrence after surgery for stage I–IIa breast cancer; recurrence diagnosed within previous 56 days</p>	<p>Assessments: T0: baseline, T1: 5 months post-intervention</p>	<p>Usual care</p>	<p>CARES-SF psychosocial scale, CES-D</p>	<p>No significant group differences</p>	
<p>Gotay 2007  Southwest Oncology Group cooperative group PR not reported, RR 81% Two-group RCT, intervention (n = 33) versus control (n = 33)</p>	<p>Stage I–II breast cancer; diagnosis in past 6 months, under age 65</p>	<p>Assessments: T0: baseline, T1: 3 months post-intervention</p>	<p>Usual care</p>	<p>QOL-BC (modified scale), POMS-SF</p>	<p>No significant group by time interaction for overall QOL</p>	
<p>Heiney 2003  Two private oncology practices in South Carolina  35% PR, 97% RR Two-group RCT, intervention (n = 50) versus control (n = 50)</p>	<p>Female, recent breast cancer diagnosis, lumpectomy or mastectomy, receiving radiotherapy, Danish-speaking</p>	<p>Assessments: T0: baseline (4 days before first session), T1: immediately post-intervention, T2: 3 months post-intervention</p>	<p>Usual care</p>	<p>EORTC QOL-C30, QOL-BR23</p>	<p>Significant group by time interaction for total mood disturbance (POMS) albeit not in the hypothesized direction</p>	
<p>Hoyer 2011</p>	<p>Duration: one call</p>	<p>Assessments: T1: 4 weeks after radiotherapy or</p>	<p>Usual care</p>	<p>Assessments: T1: 4 weeks after radiotherapy or</p>	<p>No significant group differences</p>	

(Continues)

Table 1. (Continued)

Reference	Study design setting	Eligibility criteria	Telephone psychosocial intervention	Comparator	Primary outcomes, timing of measurements	Primary psychosocial outcome findings
Livingston 2010	Hospital-based radiotherapy ward, Denmark 83% PR, 99% RR Three-group block randomized design: active referral—4 outcalls (AR4, n = 209), active referral—1 outcall (AR1, n = 197), passive referral to cancer helpline (PR, n = 165) Referring specialists (urologists for prostate cancer and surgeons for colorectal cancer-CRC)	Male, prostate or colorectal cancer with prognosis more than 52 weeks	AR4: four total outcalls, 1 week, 6 weeks, 3 months, 6 months post-diagnosis, mean 15–19 min, delivered by cancer helpline nurses  AR1: one total outcall, 1 week post-diagnosis, mean 19 min, delivered by cancer helpline nurses	PR (participant-initiated calls), cancer helpline usual service, mean 23 min (n = 29, 18% of group)	10–18 days after intervention; no baseline  HADS, composite cancer worry/distress scale  Assessments: T0: baseline (diagnosis), T1: 4 months post-diagnosis, T2: 7 months post-diagnosis, T3: 12 months post-diagnosis	AR4 showed statistically significant improvement in mean depression scores from T1 to T2, compared with PR. No significant effects at T3
Marcus 2010	88% PR, 89% RR Two-group RCT, intervention (n = 152) versus control (n = 152)  Multi-site: 21 medical centers and hospitals	Immediately following last treatment visit for stage I–IIIA breast cancer	Duration: 6 months 16 total calls, 6 calls—2 weeks apart, then 10 calls—1 month apart, mean 45 min, delivered by psychosocial oncology counselors	Usual care, literature, resource guide tailored by geographic area	IES intrusion subscale, CES-D, composite personal growth scale  Assessments: T0: baseline, T1: immediately post-intervention, T2: 6 months post-intervention	No significant group differences for IES or CES-D Significant intervention effects for personal growth at T1 and T2
Mishel 2002	86% PR, 80% RR 3 × 2 randomized block RCT, three treatment arms: uncertainty management (UM) direct, UM supplemented to spouse, and control: crossed by race (Caucasian, African American), n = 252 (unspecified number per group)	African American and Caucasian men, localized prostate carcinoma, 2 weeks post-catheter removal after surgical treatment and/or within 3 weeks into radiation therapy, available partner	Duration: 12 months UM: eight weekly calls, delivered by nurse matched on ethnicity and gender	Usual care, printed health information unrelated to prostate cancer	MUIS assessments: T0: baseline, T1: 2 months post-intervention, T2: 5 months post-intervention	No significant group differences



Mishel 2005	<p>Nine facilities in North Carolina 77% PR, 95% RR</p> <p>2 x 2 randomized block RCT, intervention (n = 244) vs. control (n = 265): crossed by race (Caucasian, African American) 13 institutions in North Carolina</p> <p>(8 comprehensive cancer centers, and regional and local hospitals). Additional recruitment of African American survivors via radio, newspapers and community volunteers</p>	<p>African-American and Caucasian breast cancer survivors, 5–9 years post-treatment, no concurrent treatment for another cancer; recurrence free</p>	<p>Four weekly calls, delivered by nurses</p>	<p>Usual care</p>	<p>POMS-SF</p>	<p>No significant effects</p>
Nelson 2008	<p>55% PR, 89% RR</p> <p>Two-group RCT, intervention (n = 27) versus control (n = 23)</p> <p>Regional cancer registries</p>	<p>Completion of treatment for stage I–III cervical cancer, English and Spanish speaking, 9–24 months post-diagnosis</p>	<p>Call length: not specified</p> <p>Duration: 1 month</p> <p>Six total calls, five weekly calls, one booster call 1 month later, mean 45–50 min, delivered by psychologist</p> <p>Duration: 2 months</p>	<p>Usual care</p>	<p>FACT-Cx</p>	<p>Assessments: T0: baseline, T1: 9 months post-intervention</p> <p>Significant group differences favoring the intervention group</p>
Samarel 2002	<p>29% PR, 72% RR</p> <p>Three-group RCT, combined individual telephone and in-person group social support and education (n = 34), versus telephone-only social support and education (n = 48), versus education-only group (one-time mailing, n = 43)</p>	<p>Women who had surgery for stage 0–III breast cancer 4 weeks prior to study</p>	<p>In-person and telephone (most intensive): 19–21 total calls, phase 1: 8–10 weekly telephone social support and education, phase 2: 8 weekly in-person support and education, phase 3: 3 months of twice-monthly telephone social support and education, then 5 monthly telephone social support and education</p>	<p>Education-only (least intensive): mailed resource kit</p>	<p>VAS-W, EWBS, POMS</p>	<p>Assessments: T0: baseline, T1: 2 weeks post-intervention</p> <p>Significantly higher mood disturbance in the education-only group than the other groups at T1, T2 and T3</p>
						<p>Assessments: T0: baseline, T1: end of phase 1 (8–10 weeks post-baseline), T2: end of phase 2 (8-weeks after T1), T3: end of phase 3 (8 months after T2)</p>

(Continues)

Table 1. (Continued)

Reference	Study design setting	Eligibility criteria	Telephone psychosocial intervention	Comparator	Primary outcomes, timing of measurements	Primary psychosocial outcome findings
Sandgren 2000	Physician offices, hospitals, cancer support organizations in northern and central New Jersey  PR not reported, 68.3% RR Two-group RCT, intervention ( $n = 24$ ) versus control ( $n = 29$ )	Stage 1–2 breast cancer diagnosis in past 3–4 months	Telephone-only: 27–29 total calls, phase 1: 8–10 weekly telephone social support and education, phase 2: 8 weekly calls, phase 3: twice-monthly calls for 3 months, then monthly for 5 months, mailed resource kit Duration: 13 months Up to 10 total calls (mean 9 calls), 4 weekly calls, biweekly for 12–weeks, mean 20–25 min, delivered by clinical psychology master's candidates Duration: 4 months	Usual care	POMS, composite distress measure derived from POMS stress questions	No significant group by time interactions for all POMS subscales at T1 and T2
Sandgren 2007	Tertiary cancer treatment center  78.5% PR, 85.5% RR 2:2:1 ratio RCT, two interventions: health education (HE, $n = 76$ ), emotional expression (EE, $n = 89$ ) versus control ( $n = 49$ ) Two cancer treatment clinics	Stage I–III breast cancer, 1–3 months post-diagnosis, undergoing adjuvant treatment	EE: six total calls, five weekly calls, sixth follow-up call approximately 3 months later, mean 30 min, delivered by certified oncology nurses trained by a clinical psychologist Duration: 6 months	HE: reviewed six relevant topics, no counseling, calls were of similar length and frequency as EE  Control: usual care	Assessments: T0: baseline, T1: immediately post-intervention, T2: 6 months post-intervention  FACTG, POMS, PSS	Significant group by time interaction for distress with intervention group reporting less stress at T1 but slightly increased at T2  No significant EE intervention effects
Sherman 2012	74% PR, 92% RR  Four-group RCT of patient-partner dyads to standard care/disease management (DM, $n = 59$ ), standardized video psychoeducation (SE, $n = 66$ ), telephone	Early stage breast cancer, available partner	T.C: four phase-specific calls, delivered by nurse	SE + TC: four phase-specific psychoeducation videos, four phase-specific calls, delivered by nurse. Call length: not specified	Assessments: T0: baseline, T1: immediately post-intervention, T2: 7 months post-intervention	Significant time effects from T1–T2 for all three conditions for FACT-G and POMS  Significant group differences for PSS, not in the hypothesized direction, with HE participants showing less stress than EE or control participants T1 No significant effects

counseling (TC, *n* = 66),  
SE + TC (*n* = 58)  
Three major medical centers,  
one community hospital in  
New York City

SE: four phase-specific  
psychoeducation videos  
DM: usual care

Call length: not specified

Assessments: T0: baseline,  
T1: diagnosis, T2: 2 days  
post-surgery, T3: adjuvant  
treatment, T4: on-going  
recovery phase

Duration: not specified

74% PR, 92% RR

RCT, randomized control trial; PR, participation rate; RR, retention rate; POMS, profile of mood states; FACT-G, Functional Assessment of Cancer Therapy-General; CES-D, the Center for Epidemiologic Studies-Depression Scale; PANAS, the positive and negative affect schedule; SF-12, short form-12 health survey; ICS, index of clinical stress; PPS, perceived stress scale; QOL-CS, quality of life-cancer survivors; PSS-FA, perceived social support-family scale; QOL-BC, quality of life-breast cancer; STAI, State-Trait Anxiety Inventory; GTUS, Growth Through Uncertainty Scale; POMS-SF, profile of mood states-short form; HADS, hospital anxiety and depression scale; IPRI-SF, interpersonal relationship inventory-short form; FOR, fear of recurrence scale; RU, resource use scale; PAIS-SR, psychosocial adjustment to illness scale-self-report; CARES-SF, Cancer Rehabilitation Evaluation System-short form; EORTC QOL-C30, European Organization for Research and Treatment of Cancer, Quality of Life Questionnaire-Cancer-specific, 30 questions; QOL-BR23, Quality of Life-Breast Cancer 23 questions; IES, impact of event scale; MUIS, managing uncertainty in illness scale; FACT-Cx, Functional Assessment of Cancer Therapy-for patients with cancer of the Cervix; VAS-W, the visual analogue scale—worry; EWBS, existential well-being scale; PAL-C, the profile of adaptation to life-clinical scale; BCTRI, breast cancer treatment response inventory; SRHS, self-report health scale; PAIS, Psychosocial Adjustment to Illness Scale

## Conclusions

There have been numerous previous reviews of the literature summarizing the state of the science of intervention research in psychosocial oncology [3,14–16,19,20]. Although these reviews are generally supportive of psychosocial interventions for patients with cancer and survivors, a number of methodological concerns have been noted, including poor reporting, insufficient internal validity and measurement limitations [3,19,20]. This review is among the first to summarize the literature involving telephone intervention trials in psychosocial oncology. Although limited to a single intervention modality, we also found many of the same methodological concerns noted in these earlier reviews, with most of the RCTs characterized by small sample sizes, samples that were mainly non-Hispanic white and disproportionately focused on a single cancer site, typically breast cancer, and with limited follow-up for evaluation (most studies included outcome assessments limited to 6 months or less post-intervention). In addition, as noted in these previous reviews, there was substantial variability across studies in the primary end points that were examined, ranging from global assessments of HRQOL to more targeted assessments of depression, anxiety, cancer-specific distress, and uncertainty. Lacking more standardization in these outcome assessments, comparisons across RCTs and drawing informed inferences from this research can be especially challenging.

Also complicating this review, which has likewise been noted in previous reviews of intervention research in psychosocial oncology [3,19,20], is the lack of consistency in adhering to the CONSORT reporting guidelines for intervention trials [65]. For example, among the most frequent omissions in this regard were dates of recruitment and follow-up, how sample size was determined and results for each group including effect size for each primary and secondary outcome. Given that adherence to these CONSORT guidelines represents a best practice when reporting results from intervention trials, investigators as well as scientific journals should be especially attentive to this problem.

In terms of assessing telephone intervention efficacy in psychosocial oncology, this review indicates that while 9 of 20 studies reported statistically significant or marginally significant effects, these were typically not robust across multiple end points within the same study nor were these effects robust across studies that shared the same or similar end points. In addition, most of these effects appear to be modest in magnitude, although very few of these studies (as noted in the preceding texts) reported effect sizes in adherence with the CONSORT reporting guidelines for intervention trials. Also noteworthy is that among the RCTs showing significant or marginally significant effects, few commonalities could be identified that would separate these studies from those not reporting such

effects. For example, these studies do not appear to be distinctive in citing a guiding theoretical framework, utilizing larger sample sizes or relying on a particular subset of primary end point assessments, nor were they distinctive in the duration or intensity of telephone intervention exposure. However, it is instructive to note that most of the studies reporting significant or marginally significant effects were distinctive in their use of intervention staff with backgrounds in psychology or professional psychosocial counseling [7,31,44,47], as opposed to training medical staff (e.g. nurses) or peer counselors to deliver psychosocial interventions by telephone. While high psychosocial distress has been correlated with reported effects in some studies [3], only one study in the present review screened on the basis of psychosocial need [31]. Low baseline levels of distress could potentially have influenced the modest effects seen in the studies in this review.

Given that telephone interventions in psychosocial oncology hold promise for extending the reach of psychosocial support programs for patients with cancer and survivors, more research seems indicated to further establish the efficacy of this intervention modality. Underscoring the urgency of such research is the 2015 ACoS accreditation requirements for cancer programs [13], psychosocial telephone interventions can offer a viable programmatic option for providing exportable and sustainable service to those patients reporting elevated distress during a pivotal patient encounter. However, to avoid the limitations that characterize the current body of research, the next generation of research should implement protocols and procedures to address the methodological concerns and problems noted in the preceding texts.

Given that the current body of science includes several studies that provide proof of concept in reporting significant intervention effects for telephone interventions in psychosocial oncology, [7,44,66,67] we would also argue for a timely and fundamental shift in the funding paradigm for such research. The vast majority of psychosocial oncology research to date has been conducted on breast cancer survivors [4]. Because such findings may not generalize to other cancer diagnoses, greater diversity in diagnoses is needed in future research. What this body of research needs is several well-designed, theory-based RCTs that will have sufficient statistical power and extended follow-up to provide more definitive evidence for intervention efficacy among diverse patient with cancer populations and across the cancer care continuum. Such

research would likely require multi-institutional collaborations and centralized data coordinating centers, guided by intervention and research methodology best practices. Such studies should likewise be designed and conducted to enhance future dissemination and implementation research that could subsequently produce exportable and sustainable standard service programs in psychosocial oncology. They should therefore also identify and measure implementation barriers as well as cost-effectiveness parameters. This vision for the future is compelling and represents the next logical step for this field of research, which would be greatly accelerated with dedicated funding opportunities to encourage such research.

Finally, as in any systematic review, several key limitations should be acknowledged. As noted earlier, this review was limited to RCTs, thus excluding studies that were qualitative or quasi-experimental in design, both of which can also be instructive when assessing telephone interventions in psychosocial oncology. Similarly, this review did not include assessments of intermediate end points or mediator variables (e.g. coping self-efficacy) or process evaluations of telephone interventions (e.g. perceived utility and satisfaction), which can likewise be highly informative even though such evidence cannot be used to establish intervention efficacy. This review also excluded studies that were not published in English or Spanish in a peer-reviewed scientific journal up until March 2013. In addition, while a rigorous protocol was implemented to identify eligible studies, it is possible that studies relevant to this review were inadvertently missed. Although this possibility must be acknowledged, in our view, it is doubtful that the dominant pattern of results and the observations inferred from this review would be substantially amended if such studies were indeed excluded, including the over-arching conclusion that while the findings from this review were mixed in terms of intervention efficacy, proof of concept has been sufficiently established to allow for more definitive larger scale trials with dedicated funding opportunities to support such research.

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### Conflict of interest

The authors have declared no conflicts of interest.

### References

- Zabora J, BrintzenhofeSzoc K, Curbow B, Hooker C, Piantadosi S. The prevalence of psychological distress by cancer site. *Psycho-Oncology* 2001;**10**(1):19–28. DOI: 10.1002/1099-1611(200101/02)10:1<19::AID-PON501>3.0.CO;2-6
- Carlson L, Angen M, Cullum J, et al. High levels of untreated distress and fatigue in cancer patients. *Br J Cancer* 2004;**90**(12):2297–2304. DOI: 10.1038/sj.bjc.6601887
- Preyde M, Synnott E. Psychosocial intervention for adults with cancer: a meta-analysis. *J Evid Based Soc Work* 2009;**6**(4):321–347. DOI: 10.1080/15433710903126521
- Stanton AL. What happens now? Psychosocial care for cancer survivors after medical treatment completion. *J Clin Oncol* 2012;**30**(11):1215–1220.
- Kaiser NC, Hartoonian N, Owen JE. Toward a cancer-specific model of psychological distress: population data from the 2003–2005 national health interview surveys. *J Cancer*

- Surviv* 2010;1–12. DOI: 10.1007/s11764-010-0120-3
6. Hoffman KE, McCarthy EP, Recklitis CJ, Ng AK. Psychological distress in long-term survivors of adult-onset cancer: results from a national survey. *Arch Intern Med* 2009; **169**(14):1274–1281. DOI: 10.1001/archinternmed.2009.179
  7. Marcus AC, Garrett KM, Cella D, et al. Can telephone counseling post treatment improve psychosocial outcomes among early stage breast cancer survivors? *Psycho-Oncology* 2010; **19**(9):923–932. DOI: 10.1002/pon.1653
  8. Carlson LE, Waller A, Mitchell AJ. Screening for distress and unmet needs in patients with cancer: review and recommendations. *J Clin Oncol* 2012; **30**(11):1160–1177. DOI: 10.1200/JCO.2011.39.5509
  9. Siegel R, DeSantis C, Virgo K, et al. Cancer treatment and survivorship statistics, 2012. *CA Cancer J Clin* 2012; **62**(4):220–241. DOI: 10.3322/caac.21149
  10. Erikson C, Salsberg E, Forte G, Bruinooge S, Goldstein M. Future supply and demand for oncologists: challenges to assuring access to oncology services. *J Oncol Pract* 2007; **3**(2):79–86. DOI: 10.1200/JOP.0723601
  11. Howlader N, Noone AM, Krapcho M, et al. (eds). SEER Cancer Statistics Review, 1975–2010. National Cancer Institute: Bethesda, MD. (Available from: [http://www.seer.cancer.gov/csr/1975\\_2010/](http://www.seer.cancer.gov/csr/1975_2010/)) [Accessed December 12, 2013]
  12. Parry C, Kent EE, Mariotto AB, Alfano CM, Rowland JH. Cancer survivors: a booming population. *Cancer Epidem Biomar* 2011; **20**(10):1996–2005. DOI: 10.1158/1055-9965.EPI-11-0729
  13. Commission on Cancer. American College of Surgeons Commission on Cancer. Cancer Program Standards 2012: Ensuring Patient-Centered Care. 2012. (Available from: <http://www.facs.org/cancer/coc/programstandards2012.html>) [Accessed July 20, 2013]
  14. Rueda J, Sola I, Pascual A, Subirana Casacuberta M. Non-invasive interventions for improving well-being and quality of life in patients with lung cancer. *Edited (no change to conclusions), published in* 2011(10). *Cochrane Database Syst Rev* 2011; **7**(9):CD00482. DOI: 10.1002/14651858.CD004282.pub3
  15. Glick SB, Clarke AR, Blanchard A, Whitaker AK. Cervical cancer screening, diagnosis and treatment interventions for racial and ethnic minorities: a systematic review. *J Gen Intern Med* 2012; **27**(8):1016–1032. DOI: 10.1007/s11606-012-2052-2
  16. Shepherd L, Goldstein D, Olver I, Parle M. Enhancing psychosocial care for people with cancer in rural communities: what can remote counselling offer? *Aust Health Rev* 2008; **32**(3):423–438.
  17. McBride CM, Rimer BK. Using the telephone to improve health behavior and health service delivery. *Patient Educ Couns* 1999; **37**(1):3–18.
  18. Gotay CC, Bottomley A. Providing psychosocial support by telephone: what is its potential in cancer patients? *Eur J Cancer Care* 1998; **7**(4):225–231.
  19. Rehse B, Pukrop R. Effects of psychosocial interventions on quality of life in adult cancer patients: meta analysis of 37 published controlled outcome studies. *Patient Educ Couns* 2003; **50**(2):179–186.
  20. Naaman SC, Radwan K, Fergusson D, Johnson S. Status of psychological trials in breast cancer patients: a report of three meta-analyses. *Psychiatry* 2009; **72**(1):50–69. DOI: 10.1521/psyc.2009.72.1.50
  21. Faller H, Schuler M, Richard M, Heckl U, Weis J, Küffner R. Effects of psycho-oncologic interventions on emotional distress and quality of life in adult patients with cancer: systematic review and meta-analysis. *J Clin Oncol* 2013; **31**(6):782–793. DOI: 10.1200/JCO.2011.40.8922
  22. Stanton AL. Psychosocial concerns and interventions for cancer survivors. *J Clin Oncol* 2006; **24**(32):5132–5137. DOI: 10.1200/JCO.2006.06.8775
  23. Marcus AC, Garrett KM, Kulchak-Rahm A, Barnes D, Dortch W, Juno S. Telephone counseling in psychosocial oncology: a report from the cancer information and counseling line. *Patient Educ Couns* 2002; **46**(4):267–275. DOI: 10.1016/S0738-3991(01)00163-X
  24. Rainey LC. Cancer counseling by telephone help-line: the UCLA psychosocial cancer counseling line. *Public Health Rep.* 1985; **100**(3):308–315.
  25. Mermelstein HT, Holland JC. Psychotherapy by telephone: a therapeutic tool for cancer patients. *Psychosomatics* 1991; **32**(4):407–412. DOI: 10.1016/S0033-3182(91)72042-2
  26. Eakin EG, Lawler SP, Vandelanotte C, Owen N. Telephone interventions for physical activity and dietary behavior change: a systematic review. *Am J Prev Med* 2007; **32**(5):419–434.
  27. Goode AD, Reeves MM, Eakin EG. Telephone-delivered interventions for physical activity and dietary behavior change: an updated systematic review. *Am J Prev Med* 2012; **42**(1):81–88.
  28. Stead LF, Perera R, Lancaster T. Telephone counseling for smoking cessation. *Cochrane Database Syst Rev* 2006; **3**:CD002850. DOI: 10.1002/14651858.CD002850.pub2.
  29. Goodwin PJ, Segal RJ, Vallis M, et al. Randomized trial of a telephone-based weight loss intervention in postmenopausal women with breast cancer receiving letrozole: the LISA trial. *J Clin Oncol* 2014; **32**:2231–2239. DOI: 10.1200/JCO.2013.53.1517
  30. Allard NC. Day surgery for breast cancer: effects of a psychoeducational telephone intervention on functional status and emotional distress. *Oncol Nurs Forum* 2007; **34**(1):133–141. DOI: 10.1188/07.ONF.133-141
  31. Ashing-Giwa KT. Enhancing physical well-being and overall quality of life among underserved Latina-American cervical cancer survivors: feasibility study. *J Cancer Surviv* 2008; **2**(3):215–223. DOI: 10.1007/s11764-008-0061-2
  32. Badger T, Segrin C, Dorros SM, Meek P, Lopez AM. Depression and anxiety in women with breast cancer and their partners. *Nurs Res* 2007; **56**(1):44–53.
  33. Badger TA, Segrin C, Figueredo AJ, et al. Psychosocial interventions to improve quality of life in prostate cancer survivors and their intimate or family partners. *Qual Life Res* 2011; **20**(6):833–844. DOI: 10.1007/s11136-010-9822-2
  34. Badger TA, Segrin C, Hepworth JT, Pasvogel A, Weihs K, Lopez AM. Telephone-delivered health education and interpersonal counseling improve quality of life for Latinas with breast cancer and their supportive partners. *Psycho-Oncology* 2012; **22**(5):1035–1042. DOI: 10.1002/pon.3101
  35. Bailey Jr DE, Mishel MH, Belyea M, Stewart JL, Mohler J. Uncertainty intervention for watchful waiting in prostate cancer. *Cancer Nurs* 2004; **27**(5):339–346.
  36. Crane-Okada R, Freeman E, Kiger H, et al. Senior peer counseling by telephone for psychosocial support after breast cancer surgery: effects at six months. *Oncol Nurs Forum* 2012; **39**(1):78–89. DOI: 10.1188/12.ONF.78-89
  37. Downe-Wamboldt BL, Butler LJ, Melanson PM, et al. The effects and expense of augmenting usual cancer clinic care with telephone problem-solving counseling. *Cancer Nurs* 2007; **30**(6):441–453.
  38. Gotay CC, Moinpour CM, Unger JM, et al. Impact of a peer-delivered telephone intervention for women experiencing a breast cancer recurrence. *J Clin Oncol* 2007; **25**(15):2093–2099. DOI: 10.1200/JCO.2006.07.4674
  39. Heiney SP, McWayne J, Hurley TG, et al. Efficacy of therapeutic group by telephone for women with breast cancer. *Cancer Nurs* 2003; **26**(6):439–447.
  40. Hoyer BB, Toft GV, Debess J, Ramlau-Hansen CH. A nurse-led telephone session and quality of life after radiotherapy among women with breast cancer: a randomized trial. *Open Nurs J* 2011; **5**:31–37. DOI: 10.2174/1874434601105010031
  41. Livingston PM, White VM, Hayman J, Maunsell E, Dunn SM, Hill D. The psychological impact of a specialist referral and telephone intervention on male cancer patients: a randomised controlled trial. *Psycho-Oncology* 2010; **19**(6):617–625. DOI: 10.1002/pon.1609
  42. Mishel MH, Belyea M, Germino BB, et al. Helping patients with localized prostate carcinoma manage uncertainty and treatment side effects. *Cancer* 2002; **94**(6):1854–1866. DOI: 10.1002/cncr.10390
  43. Mishel MH, Germino BB, Gil KM, et al. Benefits from an uncertainty management intervention for African-American and Caucasian older long-term breast cancer survivors. *Psycho-Oncology* 2005; **14**(11):962–978. DOI: 10.1002/pon.909
  44. Nelson EL, Wenzel LB, Osann K, et al. Stress, immunity, and cervical cancer: biobehavioral outcomes of a randomized clinical

- trail. *Clin Cancer Res* 2008;**14**(7):2111–2118. DOI: 10.1158/1078-0432.CCR-07-1632
45. Samarel N, Tulman L, Fawcett J. Effects of two types of social support and education on adaptation to early stage breast cancer. *Res Nurs Health* 2002;**25**(6):459–470. DOI: 10.1002/nur.10061
  46. Sandgren AK, McCaul KD, King B, O'Donnell S, Foreman G. Telephone therapy for patients with breast cancer. *Oncol Nurs Forum* 2000;**27**(4):683–688.
  47. Sandgren AK, Mccaul KD. Long-term telephone therapy outcomes for breast cancer patients. *Psycho-Oncology* 2007;**16**(1):38–47. DOI: 10.1002/pon.1038
  48. Sherman DW, Haber J, Hoskins CN, et al. The effects of psychoeducation and telephone counseling on the adjustment of women with early-stage breast cancer. *Appl Nurs Res* 2012;**25**(1):3–16. DOI: 10.1016/j.apnr.2009.10.003
  49. Moher D, Liberati A, Tetzlaff J, Altman DG. Preferred reporting items for systematic reviews and meta-analyses: the PRISMA statement. *Ann Intern Med* 2009;**151**(4):264–269.
  50. Moher D, Hopewell S, Schulz KF, et al. CONSORT 2010 explanation and elaboration: updated guidelines for reporting parallel group randomised trials. *BMJ* 2010;**340**:c869. DOI: 10.1136/bmj.c869
  51. Scura KW, Budin W, Garfing E. Telephone social support and education for adaptation to prostate cancer: a pilot study. *Oncol Nurs Forum* 2004;**31**(2):335–338. DOI: 10.1188/04.ONF.335-338
  52. Allen SM, Shah AC, Nezu AM, et al. A problem-solving approach to stress reduction among younger women with breast carcinoma. *Cancer* 2002;**94**(12):3089–3100. DOI: 10.1002/ncr.10586
  53. Oh PJ, Kim SH. Effects of a brief psychosocial intervention in patients with cancer receiving adjuvant therapy. *Oncol Nurs Forum* 2010;**37**(2):E98–E104. DOI: 10.1188/10.ONF.E98-E104
  54. Rawl SM, Given BA, Given CW, et al. Intervention to improve psychological functioning for newly diagnosed patients with cancer. *Oncol Nurs Forum* 2002;**29**(6):967–975. DOI: 10.1188/02.ONF.967-975
  55. Beaver K, Tysver-Robinson D, Campbell M, et al. Comparing hospital and telephone follow-up after treatment for breast cancer: randomised equivalence trial. *BMJ* 2009;**338**:a3147. DOI: 10.1136/bmj.a3147
  56. Kroenke K, Theobald D, Wu J, et al. Effect of telecare management on pain and depression in patients with cancer. *JAMA* 2010;**304**(2):163–171. DOI: 10.1001/jama.2010.944
  57. Pinto BM, Dunsiger S, Waldemore M. Physical activity and psychosocial benefits among breast cancer patients. *Psycho-Oncology* 2013. DOI: 10.1002/pon.3272
  58. Pinto BM, Frierson GM, Rabin C, Trunzo JJ, Marcus BH. Home-based physical activity intervention for breast cancer patients. *J Clin Oncol* 2005;**23**(15):3577–3587. DOI: 10.1200/JCO.2005.03.080
  59. Kim SH, Shin MS, Lee HS, et al. Randomized pilot test of a simultaneous stage-matched exercise and diet intervention for breast cancer survivors. *Oncol Nurs Forum* 2011;**38**(2):E97–E106. DOI: 10.1188/11.ONF.E97-E106
  60. Djuric Z, Mirasolo J, Kimbrough L, et al. A pilot trial of spirituality counseling for weight loss maintenance in African American breast cancer survivors. *J Natl Med Assoc* 2009;**101**(6):552–564.
  61. Budin WC, Hoskins CN, Haber J, et al. Breast cancer: education, counseling, and adjustment among patients and partners: a randomized clinical trial. *Nurs Res* 2008;**57**(3):199–213.
  62. Hoskins CN, Haber J, Budin WC, et al. Breast cancer: education, counseling, and adjustment - a pilot study. *Psychol Rep* 2001;**89**(3):677–704.
  63. Badger T, Segrin C, Meek P, Lopez AM, Bonham E, Sieger A. Telephone interpersonal counseling with women with breast cancer: symptom management and quality of life. *Oncol Nurs Forum* 2005;**32**(2):273–279. DOI: 10.1188/05.ONF.273-779
  64. Kelley GA, Kelley KS, Tran ZV. Retrieval of missing data for meta-analysis: a practical example. *Int J Technol Assess Health Care* 2004;**20**(3):296–299.
  65. Schulz KF, Altman DG, Moher D. CONSORT 2010 statement: updated guidelines for reporting parallel group randomised trials. *BMC Med* 2010;**8**(1):18. DOI: 10.1186/1741-7015-8-18
  66. Meneses KD, McNeese P, Loerzel VW, Su X, Zhang Y, Hassey LA. Transition from treatment to survivorship: effects of a psychoeducational intervention on quality of life in breast cancer survivors. *Oncol Nurs Forum* 2007;**34**(5):1007–1016. DOI: 10.1188/07.ONF.1007-1016
  67. Napolitano MA, Babyak MA, Palmer S, Tapsos V, Davis RD, Blumenthal JA. Effects of a telephone-based psychosocial intervention for patients awaiting lung transplantation. *Chest* 2002;**122**(4):1176–1184. DOI: 10.1378/chest.122.4.1176