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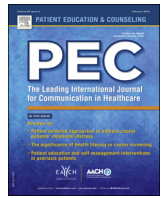


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Review article

A systematic review of Motivational Interviewing interventions in cancer patients and survivors



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ABSTRACT

Objective: To explore the use of Motivational Interviewing (MI) interventions among cancer patients and survivors, and determine aspects of intervention design that are common across successful MI interventions for this population.

Methods: We conducted a systematic review of studies addressing behavior change in cancer patients or survivors using Motivational Interviewing techniques. Studies were categorized into three groups based on behavioral outcome; lifestyle behaviors, psychosocial outcomes, and cancer-related symptom management.

Results: We included 15 studies in our analysis. Studies addressed behaviors such as diet, exercise, smoking cessation, cancer-related stress, and fatigue management. Counseling sessions varied in frequency and method of delivery, although telephone-based interventions were common. Trained oncology nurses often delivered MI sessions, and the majority of interventions included quality assessment to verify fidelity of MI techniques.

Conclusion: Solid evidence exists for the efficacy of MI to address lifestyle behaviors as well as the psychosocial needs of cancer patients and survivors. More research is needed on the use of MI for self-management of cancer-related symptoms.

Practice implications: Motivational Interviewing is a promising technique for addressing many types of behavior change in cancer patients or survivors. Intervention design must be sensitive to cancer type, phase of care, and complexity of desired behavior.

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1. Introduction

From diagnosis to treatment to survivorship care, cancer patients experience a wide variety of complex and changing needs. With more than a million new cancer diagnoses each year and nearly 14 million cancer survivors living in the US today [1], there is increasing awareness of the physical and psychosocial needs of this population as they move through the continuum of care. In addition to traditional cancer therapies used with curative or palliative intent, many cancer patients are encouraged to change personal habits such as diet, physical activity, or smoking. For example, evidence in colorectal cancer suggests that changes in diet and exercise after diagnosis can decrease both cancer-specific and all-cause mortality [2]. Evidence for the benefits of diet and exercise change exists for many other cancer types as well, including breast [3], prostate [4] and brain cancer [5]. Beyond interventions targeted to modify diet, physical activity, or smoking, behavioral interventions also have been developed to reduce or control treatment-related side effects [6] or address cancer-related stress [7].

Helping patients change behavior, however, is not a straightforward task. Cancer creates a unique set of circumstances whereby patients are met with a “teachable moment” presenting a window of opportunity for behavior change, but patients also are burdened by the physical and mental strain of cancer treatment, which may impede the behavior change process [8,9]. Previous literature has explored a range of behavior-change frameworks, such as Cognitive Behavioral Therapy, the Transtheoretical Model, and Motivational Interviewing, all of which have been used to address health promotion among cancer survivors and found that further evidence is needed to determine what approaches are most efficacious in this population [10]. Furthermore, strategies to address health behaviors in patients who are currently undergoing cancer treatments remain unexplored. To address these complex issues, it is important to consider the efficacy of specific behavioral interventions utilized during or after cancer treatment.

One such behavioral intervention is Motivational Interviewing (MI). Described by Miller and Rollnick, this technique uses a patient-centered approach, developing the patient’s motivations for behavior change through open-ended discussions [11]. Targeted to patients who feel ambivalent about a specific behavior, Motivational Interviewing encourages reflective listening to help the subject explore their own goals and motivations for change. Although originally used to address addictive behaviors, such as alcohol and substance abuse, this technique is now widely used across the medical field to address a variety of behavioral targets. In healthy, non-cancer populations, Motivational Interviewing has shown success in smoking cessation [12], diet [13], and exercise [14] among other health behaviors. Our review of the literature sought to understand the extent to which Motivational Interviewing (MI) has been used in cancer patients and survivors, and which aspects of intervention design are common across successful MI interventions for this population. Lessons learned from this systematic review process currently are being used to design an intervention focused upon optimizing endocrine therapy use among breast cancer patients and can be useful for other cancer population applications as well.

2. Methods

Methods follow the 2009 guidelines described by the Preferred Reporting Items for Systematic Reviews and Meta-analyses (PRISMA) [15]. We used PubMed, psycINFO, Scopus, and Web of Science databases to conduct a systematic literature search of English language articles published from 1990–2015. The search terms used were: (Motivational Interviewing) AND ((Neoplasm

OR (Cancer) OR (Oncology) OR (Malignan*)). Results from these searches were consolidated using EndNote X7 citation management software. After removing any duplicates, abstracts from all articles were reviewed for relevance by a single reviewer (JS). All articles deemed to be relevant were then reviewed in full text to verify population of interest and use of MI (for any behavioral target). If inclusion of an article was unclear, a second reviewer (SW) was consulted, and inclusion was determined by consensus of the two reviewers. References from included articles and multiple review articles on behavior change approaches were also examined, but no additional relevant studies were found.

Articles were excluded for the following reasons: 1) The study did not incorporate a MI framework for its intervention. 2) The study was not conducted in cancer patients or survivors. 3) The article was an abstract only (no full text article available) or opinion piece. 4) The study was not written in English. The initial search generated 225 articles, of which 15 qualified for inclusion (Fig. 1).

Basic information was ascertained from each study meeting our inclusion criteria, including: cancer type(s) studied, behavioral target, phase of cancer care during which the intervention was conducted, and structure of MI sessions (Table 1). Studies that began during chemotherapy or radiation, or which were conducted prior to surgery, were considered to be “during treatment”, even if MI sessions continued after active treatment was completed. Studies that began after conclusion of chemotherapy, radiation, and/or surgery were considered to be “post-treatment”. Effect sizes were calculated for the primary outcome of each study. Effect sizes were calculated as Cohen’s D according to standard methods for either continuous or binary outcomes [16,17]. Smaller studies with continuous outcome measurement are reported as Hedges’ G. This calculation is comparable to Cohen’s D, but uses a small sample size correction to calculate pooled standard deviation [16].

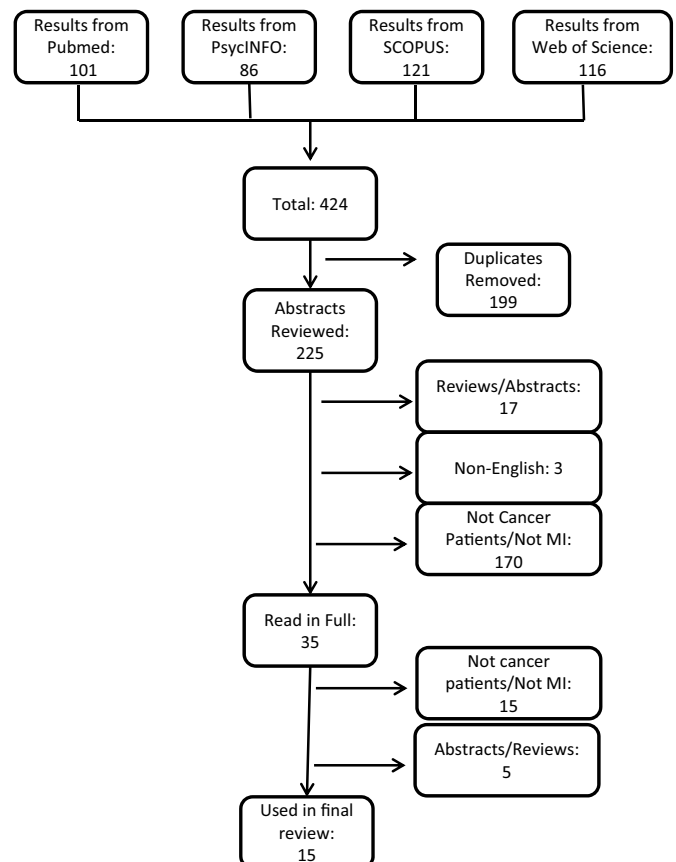


Fig. 1. Flow diagram indicating systematic review search strategy.

Table 1
Basic information for included studies.

First author, year	Cancer type	Study design	Control group	Participants (N)	Intervention target	MI delivery	During/post treatment
Alicock, 2014	Any	Cohort	None	I: 19	Patient stress	Peer counseling with MI averaging 5 calls over 6 months, delivered by cancer survivors	During
Armer, 2009	Breast	Cohort	None	I: 14	Lymphedema	Non-interventional: survey to design MI intervention	Post
Bennett, 2007	Any	RCT	2 phone calls with no MI content	I: 22C:27	Activity level	3 in-person, 3 phone calls over 6 months, delivered by physical activity counselor	Post
Djuric, 2011	Breast	RCT	Print material only	I: 20C:20	Fruit/vegetable consumption, activity level	19 phone calls over 12 months, delivered by registered dietician	During
Garrett, 2013	Any, stage I–III	Cohort	None	I: 46	Fruit/vegetable consumption, activity level	Six phone sessions over 12 weeks, delivered by Oncology counselors	Post
Harris, 2012	Breast	RCT	Group counseling	I: 11C: 24	Weight loss	22 calls over 12 months, delivered by trained health coaches	Post
Campbell, 2009 Ko, 2010	Colorectal	RCT (2 × 2)	No treatment/print material only	I: 70/72/58 C:66	Fruit/vegetable consumption	4 phone calls over 9 months, delivered by trained counselor	Post
Ream, 2015	Breast, colorectal, lymphoma	RCT	Print material only	I: 23C:21	Fatigue	3 phone calls over 3 treatment cycles, delivered by an Oncology Nurse	During
Sharp, 2008	Head and neck	Cohort	None	I: 50	Smoking cessation	Frequency unspecified, delivered by Radiation Therapy Nurses	During
Spector, 2014	Breast	Cohort	None	I: 13	Activity level	1 in-person session, 15 phone sessions over 16 weeks, delivered by nurse researcher	Post
Swenson, 2010	Breast	Cohort	None	I: 36	Activity level	In person for at least 4 chemo treatment cycles, delivered by nurse researcher	During
Thomas, 2012	Any	RCT	Print material only	I: 75/64C:88	Pain management	4 phone calls over 6 weeks, delivered by nurse researcher	During
Thomsen, 2010	Breast	RCT	No treatment	I: 58C:62	Smoking cessation	1 in-person session, delivered by trained counselor	During
Wakefield, 2007	Any	RCT	Print material only	I: 74C:63	Smoking cessation	Average of 11 calls over 3 months, by trained counselor	During

When studies used multiple intervention groups, effect sizes were calculated comparing the highest-effect group to the control group. Effect size measures the magnitude of mean difference relative to the standard deviation. We follow the generally accepted interpretation of Cohen's D score with 0.2 representing a small effect, 0.5 representing a medium effect, and 0.8 or greater representing a large treatment effect [18].

Each study was classified into one or more of three groups, based on the behavioral outcome targeted: interventions to address lifestyle behaviors, interventions to address psychosocial outcomes, and interventions to address cancer-related symptom management.

3. Results

3.1. Overview

Fifteen studies met inclusion criteria and were included in our final literature synthesis (Table 1). Two of these studies analyze different outcomes from the same trial, so the fifteen studies included represent a total of fourteen intervention designs. Although each of the studies used Motivational Interviewing as the core of their intervention, they varied widely in the timing and delivery of these techniques, as well as the cancer population and setting studied. The number of MI sessions ranged from a one-time, in-person MI session [19], to 22 phone-based MI sessions over a one-year period [20]. Eight of the fourteen interventions took place during active cancer treatment, either prior to surgery or throughout outpatient chemotherapy treatments [19,21–27]. Six studies recruited cancer survivors after treatment was completed [20,28–33]. The most commonly targeted cancer type was breast cancer, which was the subject in six of our studies [19,20,22,24,28,31]. Other cancer types specifically targeted for MI

were colorectal cancers [32] and head and neck cancers [21]. One study recruited breast, colorectal cancer, or lymphoma patients who were receiving intravenous chemotherapy [26]. Five of the reviewed studies recruited patients with any type of cancer [25,27,29,30,34].

In seven of the studies, an MI-trained nurse or dietician conducted the intervention [21–24,26,28,31], while others used MI-trained, non-nurse counselors [19,20,29,30,32]. One study trained cancer survivors to act as MI counselors for cancer patients [27].

The setting and quality control of MI sessions varied considerably across studies. Three studies conducted counseling sessions entirely in person [19,22,31], and seven studies conducted sessions entirely over the phone [20,23,24,26,27,30,32,33]. Three studies used a mix of in-person and phone-based sessions [25,28,29]. One did not specify method of delivery [21]. Five studies compared MI combined with informational print materials to informational print materials only [23–26,32] and five studies incorporated diaries or worksheets as part of their MI interventions to further reinforce the behavior change [22,24,26,28,30].

The majority of studies (eight) [21,23,24,26,28–30,32,33] included some form of review process to ensure the implementation fidelity of the MI protocol, while six of the studies made no mention of how or whether they assessed intervention implementation or quality control. Those who included a quality control process used different methods of evaluation. In two studies, a certified trainer from the Motivational Interviewing Network of Trainers (MINT) assessed a randomly selected sample of calls [28,29]. In others, a sample of sessions was assessed by a study member, using either a checklist [24,26] or a standardized coding scheme for Motivational Interviewing Treatment Integrity (MITI) [32]. Two studies held monthly meetings to reemphasize the principles of MI and discuss previous counseling sessions [21,23].

In our comparative analysis of MI interventions by behavioral outcome target, the benefit of MI is most strongly seen among lifestyle improvement interventions; however, studies addressing psychosocial outcomes and symptom management also show promise (Table 2).

3.2. Interventions for lifestyle improvement

The American Cancer Society emphasizes diet and exercise counseling as a fundamental part of cancer treatment and survivorship care [35]. Increasing these types of healthy behaviors is by far the most common use of MI within cancer patient populations to date. However, even within these studies, heterogeneity existed in intervention design and outcomes.

Studies targeting dietary change proved to be generally successful in both patients undergoing treatment and survivors. Effect sizes for these interventions ranged from moderate to very strong (Table 2), suggesting that in addition to being statistically relevant, the increase in fruit and vegetable consumption seen in these studies is large enough in magnitude to be clinically relevant if sustained over time. A study of women undergoing active breast cancer treatment showed a statistically significant increase in fruit and vegetable servings per day from 4.4 to 7.5 in the group receiving MI, with no significant change in the control group [24]. Another study in multiple cancer types saw a smaller, but still statistically significant, increase from 3.8 to 4.6 servings of fruits and vegetables pre- to post-MI, although no control group was

included [30]. Campbell and colleagues divided participants into one of three possible treatment categories- tailored print material only, MI only, or a combination of both- and a control group. Using a 35-item measure of fruit and vegetable consumption, no statistically significant difference in fruit and vegetable consumption was seen among groups. However, using a simplified 2-question method, significant improvement was seen for all intervention groups compared to control. The strongest effect for this 2-question measure was observed in the combination of targeted print material and Motivational Interviewing [32]. A separate analysis of participant feedback about the intervention showed that perceived relevance of the material and level of trust in the communication were important mediators of the increase in fruit and vegetable consumption [33].

Another lifestyle change targeted in multiple studies was physical activity level. Five studies included physical activity as an outcome measure, and all showed a significant improvement in physical activity when MI was introduced, with moderate effect sizes for measures of activity and small effect sizes for physical measures [22,24,28–30]. Four of these studies focused on increasing activity level in survivors [22,28,30], whereas two other studies focused on patients currently in active treatment [24,29]. Spector and colleagues conducted weekly phone-based sessions with breast cancer survivors. After 16 weeks, average physical activity increased from 39 min/week at baseline to 252 min/week [28]. A study in multiple different types of cancer survivors observed a comparable increase in physical activity (from

Table 2
Results by category from included studies.

First author, year	Cancer type	Study design	Participants (N)	Outcome	Effect size (d/g)
Thomsen, 2010	Breast	RCT	I: 58C:62	Smoking cessation Perioperative- I: 28% C:11% One year follow up- I:13% C:9% (ns)	Perioperative: $d = 0.497$
Wakefield, 2007	Any type	RCT	I: 74C:63	Six months- I: 12% C: 8% (ns)	$d = 0.123$
Sharp, 2008	Head and Neck	Cohort	I: 50	One year- I: 68%	--
Spector, 2014	Breast	Cohort	I: 13	Physical activity Increase in weekly physical activity over baseline ($p = 0.001$)	--
Swenson, 2010	Breast	Cohort	I: 36	Overall 67% adherence rate to walking intervention	--
Garrett, 2013	Any type, stage I–III	Cohort	I: 46	Increase in total physical activity over baseline ($p = 0.006$)	$d = 0.425$
Harris, 2012	Breast	RCT	I: 11C: 24	Body weight significantly decreased after 1 year ($p = 0.012$)	$g = 0.167$
Bennett, 2007	Any type	RCT	I: 22C:27	Increase in physical activity over control ($p < 0.01$)	$d = 0.550$
Djuric, 2011	Breast	RCT	I: 20C:20	Increase in total physical activity over baseline ($p < .05$)	$g = 0.658$
Garrett, 2013	Any type, stage I–III	Cohort	I: 46	Fruit/vegetable consumption Increase in fruit/vegetable consumption over baseline ($p = 0.02$)	$d = 0.425$
Djuric, 2011	Breast	RCT	I: 20C:20	Increase in fruit and vegetable consumption over baseline ($p < 0.05$)	$g = 1.44$
Campbell, 2009	Colorectal	RCT	I:70/74/ 58C:66	No change by 35-item measure, increase by 2-item measure ($p < 0.05$)	2 item measure: $g = 0.459$
Allicock, 2014	Any type	Cohort	I: 19	Psychosocial measures 73% of participants felt the program improved their quality of life	--
Garrett, 2013	Any type, stage I–III	Cohort	I: 46	Reduction in cancer specific intrusion ($p < 0.001$) and Avoidance ($p = 0.002$)	Intrusion: $d = 0.630$ avoidance: $d = 0.361$
Djuric, 2011	Breast	RCT	I: 20C:20	Significant increase in FACT-B scores over baseline ($p < 0.05$). No change in FACT-G	FACT-B: $g = 0.231$
Thomas, 2012	Any type	RCT	I: 75/64C:88	No change in FACT-G scores	$d = 0.054$
Spector, 2014	Breast	Cohort	I:13	Increases in FACT-BCS ($p = 0.03$)	--
Ream, 2015	Breast, colorectal, lymphoma	RCT	I: 23C:21	Decrease in fatigue distress score	$d = 0.620$
Ream, 2015	Breast, colorectal, lymphoma	RCT	I: 23C:21	Self-care measures Increase in fatigue self efficacy	$d = 0.34$
Thomas, 2012	Any type	RCT	I: 75/64C:88	No change in pain intensity, decrease in pain interference ($p = 0.02$)	Pain Interference: $d = 0.154$
Armer, 2009	Breast cancer patients	Cohort	I: 14	Qualitative assessment of themes in self care of lymphedema to inform MI intervention	--

167 min/week to 242 min/week) with six MI sessions conducted over 12 weeks [30]. A randomized controlled trial in multiple types of cancer survivors saw a difference in activity of 1159 kcal/week when comparing six monthly MI sessions to usual care [29]. Lastly, a telephone based MI intervention promoting healthy behaviors in breast cancer survivors saw a significant decrease in weight and BMI after one year, with a non-significant decrease in those who received group counseling only [20].

Two studies considered MI interventions that were administered while patients were still in active cancer treatment [24,29]. Patients in a cohort study receiving MI at chemotherapy visits averaged 75% of the recommended steps count over a six-week period [22]. In another intervention that began at the start of chemotherapy and included 19 phone calls over a one year period, no difference in total physical activity was observed at 6 months, but a significant increase over baseline was noted at one year (172 min/week to 364 min/week) [24]. Notably, both studies conducted concurrently with treatment showed a high dropout rate. Djuric and colleagues saw a 35% dropout rate in the telephone counseling group compared to only 15% in the control group over one year [24]. Swenson, Nissen, and Henly lost 19% of their participants—most in the early stages of the study [22]. Overall, these findings suggest success for increasing physical activity levels in cancer populations, but caution that some regimens may be too intense for those undergoing active cancer treatment.

Smoking cessation is also a source of concern for cancer patients, survivors, and their care providers. Patients who continue to smoke after cancer diagnosis are more likely to experience complications during treatment, as well as have a recurrence or an additional malignancy after treatment of the initial cancer [36]. Three studies examined the use of MI for smoking cessation among cancer patients and survivors; their results were mixed. One examined MI compared to standard care for perioperative smoking cessation [19]. The authors found that patients receiving one session of in-person Motivational Interviewing were more likely (28% vs. 11%) to be smoke-free from two days before surgery until ten days after surgery, although this improvement did not translate into significantly reduced complications or cessation maintenance at one year after intervention [19]. Another randomized controlled trial considered MI for smoking cessation across multiple cancer types. This implementation was more intensive, including both phone-based and in-person counseling, averaging 11 sessions per participant over six months. While those in the MI intervention group were significantly more likely to report attempting to quit smoking, there was no significant improvement in cessation rate over standard care at six month follow up (12% vs. 8%) [25]. A third smoking cessation trial completed in Sweden had more promising results. The intervention targeted patients with head or neck cancers and observed a 68% cessation rate at one year after the intervention, much higher than observed in previous studies with cancer populations. However, the frequency of contact by the MI nurses was not reported, and there was no control group. These omissions make it harder to understand the role that MI played in patients' decisions to quit [21].

3.3. Interventions for psychosocial support

Cancer patients experience emotional distress both during [37] and after treatment [38] and several studies used MI methods to reduce cancer-related stress or improve health-related quality of life, often measured as secondary outcomes in studies primarily targeting other outcomes [23,24,26–28,30]. A 2013 study trained cancer survivors in motivational interview techniques and matched them with a patient in active treatment [34]. The exact structure of the MI, including the frequency of contact and the topics addressed, were flexible based on patient needs. The average

participant received five calls over the six-month study period, with a range from one to thirteen calls. 60% of participants reported increased feelings of optimism/acceptance as a result of talking to their MI counselor, and 73% believed the MI program had a positive impact on their overall quality of life [27].

Other studies collected patient surveys to assess quality of life. Djuric and colleagues administered the FACT-G and FACT-B surveys, measures of quality of life for cancer (general) and breast cancer patients, respectively. Participants in the MI intervention group scored significantly higher on the FACT-B survey at one year, with no significant change in the control group. No changes were seen in the FACT-G scores [24]. Another breast-cancer based study also saw significant improvement associated with MI as compared to baseline using the FACT-B survey, although only on the breast cancer specific subscale [28]. In addition, Garrett and colleagues collected data among multiple cancer types using the Impact of Event Scales for Intrusion (IES-I) and Avoidance (IES-A). These instruments measure the extent to which a stressful event intrudes in functioning and causes avoidant behaviors, respectively. Participants showed a significant decrease in both avoidance and intrusion scores, with the most dramatic difference seen in patients with melanoma [30]. A study of fatigue management assessed fatigue-related distress and found that MI was associated with a decrease in fatigue-related stress, while fatigue-related stress increased in the usual care group over the same period [26]. Medium to large effects were seen in studies measuring avoidance, intrusion, and distress related to cancer (Table 2). Small or negligible effects were seen in more general quality of life surveys such as the FACT-B and FACT-G. These results suggest that even when psychosocial needs are not the primary target of an intervention, Motivational Interviewing techniques may decrease patient stress related to cancer, and may have smaller effects on overall quality of life.

3.4. Interventions for self-management of cancer-related symptoms

The least explored area for Motivational Interviewing was in patient self-management of cancer-related symptoms, such as fatigue and pain. Two studies examined the use of MI to help patients manage such symptoms during cancer treatment [23,26], and a third examined the use of MI to prevent such symptoms [31]. *Beating Fatigue* is a MI intervention delivered over 3 chemotherapy treatment cycles [26]. Three phone-based MI sessions provided information and support to improve self-efficacy in fatigue-management techniques to patients experiencing moderate or severe fatigue related to chemotherapy. Patients receiving the intervention had a non-significant reduction in global fatigue measures and improvement in fatigue-related self-efficacy compared to controls [26]. Another study explored pain self-management in cancer patients [23]. Patients received usual care, educational materials, or educational materials plus four MI-based phone calls over a six-week period to discuss pain management techniques. Compared to both usual care and the educational materials group, the MI treatment group saw significant improvement in Pain Interference Score, a measure of how much pain interferes with daily functioning. However, no significant differences were seen in patient's assessment of overall pain intensity [23].

Finally, a study completed by Armer et al. sought to understand barriers to women completing at-home exercises for lymphedema prevention [31]. Patients who had previously failed to comply with lymphedema prevention measures at home completed an open-ended survey about the challenges they faced. Some of the barriers identified by the study team included: ability to maintain focus on self-care behaviors, ability to reason within a self-care framework, lack of motivation, and ability to integrate self-care behaviors into

daily living. Based on their qualitative studies, the study team developed educational materials to help nurses better address patient needs through a combination of Motivational Interviewing and solution-focused therapy [31].

4. Discussion and conclusion

4.1. Discussion

Motivational Interviewing utilizes a flexible, patient-centered counseling format that is easily adapted for settings with limited time or resources. Compared to other common frameworks such as Cognitive Behavioral Therapy [39], Social Cognitive Theory [40], and the Transtheoretical model [41], MI's unique focus on developing patient motivation from ambivalence may be key for patients who are struggling with the physical and emotional challenges of cancer treatment or survivorship. Other behavior change techniques work within the current patient's readiness for change and generally focus on developing the patient's ability to identify and change specific behaviors through predetermined strategies. In contrast, MI seeks to build motivation and focuses on patients developing their own solutions to incorporate behavior changes into daily life. This combination of generating motivation and empowering the patient is important for patients who are experiencing treatment fatigue or may be feeling overwhelmed by efforts to address behavior concurrently with the physical demands of treatment.

This review suggests that MI is a promising tool for promoting behavior change across a variety of cancer types and treatment stages. Although the examined studies show many individual successes, it is difficult to identify consistent best practices for MI in cancer populations, because the studies reviewed varied widely in terms of the cancer populations studied, timing of MI delivery, frequency and interval of MI delivery, quality control processes, and outcome measures.

One aspect common to many studies was the method of MI delivery, often led by a nurse and conducted either partially or entirely over the phone [22–27,29,30,33,42]. Only two studies were conducted exclusively in person [19,28]. Although some studies employed counselors specifically hired to deliver MI, many simply trained already-employed oncology or radiology nurses in MI techniques. Training, when information was provided, ranged from several days [25] to several months [26]. These two deviations from the traditional MI design – using phone-based delivery and oncology nurses as counselors – offer improved feasibility and viability in a clinical setting, and our review showed no evidence that they diminish the effectiveness of the MI intervention.

Interventions that combined MI with participant worksheets or diaries to reinforce behavior change showed statistically significant improvement in one or more outcomes for the majority of studies and non-statistically significant improvement over the control group in the remaining study [22,24,26,28,30]. Especially for studies with less frequent contact, this approach may help patients to stay engaged in the target behavior between counseling sessions.

MI studies targeting smoking cessation generally had limited success in ensuring long-term maintenance of healthy behavior, with one exception among Swedish head and neck cancer patients. MI studies targeting physical activity were mostly successful, but encountered a high dropout rate when implemented among patients still undergoing chemotherapy. In designing a MI intervention for cancer populations, the phase of cancer care, the type of cancer, and the difficulty of the target behavior change should be considered in determining the best approach for intervention design.

Finally, while only one of the included studies was designed to address cancer-related stress as a primary outcome, others included such measures as secondary outcomes. Among studies that assessed quality of life measures, all but one showed an improvement in patient reported quality of life after the MI intervention. Even an intervention that was unable to significantly improve patients' cancer-related fatigue symptoms showed significant improvements in patient-reported distress. This means that regardless of whether MI results in meaningful behavior change for outcomes like smoking cessation, for example, MI may nevertheless help patients to better cope with cancer-related stress and improve quality of life.

Among our limitations was the inability to assess the quality of MI counseling received in these studies. While some studies did evaluate the fidelity of their MI training and delivery, using MINT certified trainers or a standardized coding system, others were noticeably missing any evaluation of training or quality control. As such, we cannot know the extent to which studies stayed true to the foundational principles of MI and how this affected their outcomes. Additionally, while we used four databases to conduct our search, we acknowledge that we may have missed relevant studies that were not included in these databases or that were not available in English.

4.2. Conclusion

The literature presents a variety of behavioral targets for these techniques in a cancer population, including lifestyle improvements, psychosocial support, and cancer-related symptom management. Lifestyle behavior change and psychosocial wellbeing are the most studied targets for these interventions, but initial success in symptom-management studies encourages further research in this area.

The results of this review are being used in the creation of a Motivational Interviewing intervention to improve endocrine therapy adherence among breast cancer patients. Our intervention will incorporate multiple strategies shown to be effective in the studies we have examined in this review article. First, we will use a nurse navigator trained in MI techniques to conduct counseling sessions, with the first session conducted face-to-face and five additional sessions conducted over the phone, an approach which was supported by several studies included in our review. Session content will be reinforced through participant workbooks, another strategy promoted by several studies included in our review, which will assist in goal setting as well as provide resources to address barriers to endocrine therapy adherence. In accordance with best practices in MI, sessions will be recorded and coded to ensure that MI principles are being followed with fidelity, with observation of and feedback to the MI counselor. Finally, in addition to measuring medication adherence, we will assess patient psychosocial wellbeing to determine if the intervention is able to reduce cancer-related anxiety.

4.3. Implications for practice

Motivational Interviewing is a promising approach for addressing health behaviors and psychosocial needs in a cancer population. Frequency of contact may vary with intensity of the desired behavior change and duration of follow up. Successful interventions ranged from weekly to bimonthly contact, and were conducted either by phone or in person. Combining MI with informational materials or participant workbooks/activity logs appears to be a successful strategy to reinforce behaviors and engage participants. When designing a Motivational Interviewing intervention, careful attention should be paid to the specific needs of the population given the type of cancer, stage of treatment, and

magnitude of desired change as well as to adequate training and assessment of personnel delivering the counseling sessions.

Conflict of interest

The authors report no conflicts of interest.

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