DOI: *http://dx.doi.org/10.22122/ijbmc.v9isp.441* **Published by** *Vesnu Publications*

International Journal of Body, Mind and Culture

A Systematic Review of Cognitive-Behavioral Interventions in Cancer

Fereshteh Shakibaei[1], Manouchehr Faryabi[2], Amin Rafieipour[3], Kobra Haji-Alizadeh[4]

[1] Associate Professor, Behavioral Sciences Research Center, School of Medicine, Isfahan University of Medical Sciences, Isfahan, Iran
[2] PhD Student, Department of Health Psychology, Islamic Azad University, Kish International Branch, Kish, Iran
[3] Associate Professor, Department of Health Psychology, Payame Noor University, Tehran Branch, Tehran, Iran
[4] Associate Professor, Department of Psychology, Islamic Azad University, Bandar Abbas Branch, Bandar Abbas, Iran

Corresponding Author: Amin Rafieipour***; Associate Professor, Department of Health Psychology, Payame Noor University, Tehran Branch, Tehran, Iran***
Email: rafiepoor@pnu.ac.ir

Review Article

Abstract

The goal of this study is to conduct a systematic review of cognitive-behavioral interventions for patients with cancer. The studies included in this review met the following criteria: (1) being a randomized clinical trial (RCT), (2) being a study of a cognitive-behavioral therapy that included psycho-educational, alternative, and complementary therapies (for example, acupuncture, relaxation), and tested expressive, supportive, and skill-based interventions, (3) adult participants (18 years or older) with cancer, and (4) the results being directly related to advanced studies. Treatment effects were not statistically significant in most studies, methods were not consistently described, and samples had limited racial/ethnic diversity, according to the studies included in this review. The internal validity of the studies included in this review posed significant challenges to the effectiveness of cognitive-behavioral interventions. A gap in the current knowledge base is the lack of information on the efficacy of cognitive-behavioral interventions to support people with cancer. Practical requirements are tailored to the needs of people with advanced cancer, and well-designed studies are required to test interventions that improve cancer outcomes.

Keywords: Cognitive-behavioral therapy; Systematic; Cancer

Citation: Shakibaei F, Faryabi M, Rafieipour A, Haji-Alizadeh K. **A Systematic Review of Cognitive-Behavioral Interventions in Cancer.** Int J Body Mind Culture 2022; 9(Special Issue): 3-12.

Received: 19 May 2022

Accepted: 15 Jun. 2022

Introduction

Cancer is one of the most important and difficult diseases in the world; it is the third cause of death and also the second chronic non-communicable disease (De Han et al., 2018). According to the surveys, 12% of deaths in the world are caused by cancer. Moreover, 9 million cancer cases occur annually, of which 4 million are in developing countries (Cao et al., 2021). Cancer is a disease of cells, the characteristic symptom of which is the unlimited proliferation of cells that form a malignant neoplasm. However, there are more than 200 types of cancer (Schettini, Braso-Maristany, Kuderer, & Prat, 2022). The chronic disease of cancer weakens the body and also due to the mentality of people about it, the more a person is exposed to the stresses caused by the disease, the more psychological symptoms appear in him and it becomes difficult for him to deal effectively with the disease (Roberts et al., 2016). Clinicians and researchers are increasingly aware of the fact that coping strategies play a powerful mediating role in the psychological and physiological experience of pain. Coping refers to the targeted application of cognitive and behavioral techniques to control and apply management to that group of internal and external requirements that are evaluated as a problem and their solution exceeds the available resources and facilities of a person. Folkman and Lazarus (1980) have stated in their discussion that coping requires showing mobility and trying to control stressors, and only that group of efforts that have an objective and conscious aspect can be called coping; as a result, spontaneous behaviors and thoughts that do not require effort cannot be called coping.

Anxiety and perceived stress are among the issues faced by patients with cancer. Anxiety is the feeling of an imaginary threat of an unknown and unfamiliar phenomenon. In other words, anxiety is an unpleasant and vague feeling caused by this (Schienle, Kochel, & Leutgeb, 2011), and the person expects an adverse event to occur. Although anxiety is an emotional state that helps normal people to adapt and defend themselves against various dangers, anxiety disorders create defects in these adaptive responses and cause maladaptive reactions in the form of extreme exaggerated reactions (Schienle, Kochel & Leutgeb, 2011). Perceived stress is one of the major problems of human society and countless people are struggling with it. It seems that stress is a necessary part and an inevitable result of human interaction with the environment. Perceived stress is a psychological state or process during which a person perceives his physical and psychological well-being as threatening. In other words, perceived stress is a person's perceived abilities and confidence in facing environmental demands (Lawless, Harrison, Grandits, Eberly, & Allen, 2015). One of the treatments that can be used to improve the psychological problems of patients with cancer is cognitive-behavioral therapy. Cognitive-behavioral therapy is an approach based on common sense, which is based on two fundamental principles: first, our cognitions have a controlling effect on our emotions and behavior, and second, how we function or behave leaves a strong impression on our thinking and emotional patterns (Hofmann, Asnaani, Vonk, Sawyer, & Fang, 2012). It is worth mentioning that most of the research related to the effectiveness of cognitive-behavioral therapy has shown that this training is effective in improving the condition of people in various structures. However, few researchers have investigated the effectiveness of cognitive-behavioral therapy on different structures; and as far as the researchers of this study has searched and examined, no research has been done to investigate the effectiveness of cognitive-behavioral therapy on these structures and structures related to it; therefore, by conducting the present research, we can contribute to the growth and development of science in this field. The scope and improvement of the condition of patients with cancer helped a lot**.**

Methods

MEDLINE, CINAHL, and PsycINFO were used to conduct the review. Between 2001 and 2011, databases were searched for randomized clinical trials (RCTs) of computerized brief interventions to improve the management of physical, emotional, and spiritual symptoms by changing the thoughts, feelings, beliefs, and skills of people with advanced cancer. A manual search of citations in relevant article reference lists was conducted (Porter, & Keefe, 2011; McMillan, & Small, 2007; Sherwood et.al, 2005; Bandura, 1977; Devine, 2003; Lepore & Coyne, 2006). For three reasons, we decided to concentrate on RCTs for patients with advanced cancer. First, they are regarded as the highest level of evidence. Second, randomization helps to control many threats to internal and external validity (Lepore & Coyne, 2006), and finally, systematic reviews of RCTs are considered the gold standard. The following studies were included in this review: (1) RCT was used in the design, (2) a cognitive-behavioral therapy study, which included psychoeducational, alternative, and complementary therapies (e.g., acupuncture, relaxation), and tested expressive, supportive, and skill-building interventions, (3) adult participants (18 years or older) with advanced cancer, and (4) results were directly related to patients with advanced cancer.

An article was disqualified from this review if it met any of the following criteria: (1) it was a review article, (2) it included a meta-analysis, (3) it raised methodological issues, such as analytical strategies for RCTs, (4) it included both patients with early stage (stages I-II) and advanced stage (stages II-IV) cancer, (5) it did not include patients with advanced cancer, (6) it reported only caregiver results, and (7) it reported results from tested drug interventions. We felt it was important to exclude studies that included both early-stage and late-stage patients, despite the fact that there is undoubtedly overlap in the concerns about symptom management among all patients with cancer. Patients with advanced cancer and their caregivers also have different issues that may affect symptom severity and symptom management. We also made the decision to concentrate on the effects of cognitive-behavioral therapy on patients. Patients with advanced cancer may experience different problems from their caregivers' psychosocial needs. By maintaining consistency in both the units of analysis and the results across review studies, a focus on patient outcomes enhances the review's internal validity.

Results

A study of cognitive-behavioral interventions was carried out on people with advanced cancer. Eleven studies were found to meet the inclusion criteria after the study abstract was retrieved and reviewed. Patients randomly divided into case and control groups for each study included in this review were assigned to the treatment group. The most popular way to implement allocation coverage was a sealed or opaque envelope. The most popular method of allocation was using a manual or computer-assisted randomization design followed by stratification to the clinical site. The patient was the most frequently used randomization unit. One study only made use of a unique randomization unit. In the Moorey et al. (2009) study, the randomization unit was the nurse. Two experimental and control groups of nurses who provided cognitive-behavioral interventions were randomly assigned. The home care team (identified by the patient's location) later stratified them. Baseline assessments were given to all patients registered with the nurses' office. "Cluster randomization" was used to describe this randomization technique. The home care team then began treating patients as usual. If they were receiving care from a nurse who had received training in cognitive-behavioral interventions, this nurse also used CBIs that addressed emotional issues. A description of the research team members who selected the allocation sequence, enrolled participants, assigned participants to treatment conditions, and used techniques to blind group allocation results is one quality indicator (Moher, Schulz, & Altman, 2001). The descriptions of these domains in an RCT design varied among the studies that were included in this review. The descriptions of the research team members who decided on the group allocation orders and the use of blinding were only mentioned in four studies. Information in this area is given in a study.

No research has been done in this area, but one of the team members who enrolled the participants in the study was described as having placed them in the treatment condition. Any of these modifications to blinding can result in biases that influence group equivalence, latent study retention, and study outcomes.

28 to 882 people were included in the sample. In the studies reviewed for this review, the majority of participants were described as white (between 78 and 100 percent). The majority of study samples contain various cancer types. From most prevalent to least prevalent, the following seven specific cancers were found in subjects in 11 studies: breast (8 studies), lung/chest (5 studies), prostate (2 studies), colon (3 studies), ovary (2 studies), head/neck (1 study), liver and bile ducts (1 study). The gastrointestinal system, which includes the oesophagus, pancreas, and stomach, as well as other cancers and genitourinary/gynecological (GU/GYN) cancer were included in a different description of cancer types (2 studies). One study omitted information about the subjects' particular cancer sites.

In the studies that were reviewed, advanced cancer was not consistently defined. Stages 3 and 4 of advanced cancer were determined by six studies. In-home care programmes were offered to study subjects in the other two studies. Patients in home programmes typically have a life expectancy of six months or less. Participants in one study were described as having solid tumors or lymphoma that had relapsed (Savard et al., 2006). The same-side metastases outside the breast and axilla were included in Goodwin et al. (2001) criteria for advanced breast cancer (Goodwin et al., 2001). Another study simply stated that its participants had advanced cancer without providing any further details.

The duration and frequency of the intervention are described in table 1. Articles that have been published have not consistently presented the content, length, or frequency of interventions. Of the studies that provided information on duration and frequency of contact, sessions over a period of several weeks ranged from 1 to 8 weeks (Keefe et al., 2005; Sherwood et al., 2005; Henry et al., 2010; McMillan & Small, 2007; Miller et al., 2007; Savard et al., 2006) and the number of contacts during the study period ranged from a single contact (McMillan & Small, 2007) with the interventionist to 10 contacts during the intervention period. As an illustration of the level of specificity required for reporting a cognitive-behavioral intervention in the literature, Keefe et al. (2005) described the timing, duration, and frequency of the intervention: intervention units (individuals, pairs, or groups of three or more people), the precise number of contacts/meetings with the research team, the types of contacts (face-to-face, telephone, or other media), and the average duration of each contact/meeting.

Table 1. Cognitive-behavioral interventions on cancer

Author	Interventions	Outcomes	Findings
Bakitas et al. (2009)	Number of sessions: 4 structured, educational, and problem-solving sessions, duration: 30-41 minutes, monthly telephone follow-up (or until the participant's death)	QOL, symptom severity, mood, resource utilization	Experimental group had higher scores for quality of life and mood, no improvement in symptom intensity, no difference in resource utilization
Breitbart et al. (2010)	Number of sessions: 8-weekly sessions, duration: 90 minutes	SWB, SOM, PF	Significant improvements in SWB, SOM, anxiety, and desire for death
Goodwin et al. (2010)	Number of sessions: weekly for year	Mood state, pain, survival	Experimental group had less mood disturbance and reported less worsening pain
Henry et al. (2010)	Number of sessions: 4 sessions, duration: 30-90 minutes	Life meaning, anxiety, depression, self-efficacy	Significantly enhanced meaning in life in the short term, no impact on depression or anxiety, no effect on self-efficacy
Keefe et al. (2005)	Number of sessions: 3 sessions, duration: 20-90 minutes	QOL, PWB, SWB, UP, WP	No significant treatment effects for patients' ratings of QOL, PWB, SWB, UP, or WP
McMillan & Small (2007)	Number of sessions: not described, duration: not described	Pain intensity, dyspnea, constipation, symptom distress, QOL	Experimental group had a positive effect on overall symptom distress, but not on the symptom severity of the individual, symptoms of pain, dyspnea, or QOL
Meyers et al. (2011)]	Number of sessions: 3 sessions over 30 days, duration: not described	Patients' QOL SPS	Decrease in patients' QOL, decline in problem-solving skills
Miller et al. (2007)	Number of sessions: two sessions, duration: 90 minutes	Overall QOL, QOL social domain	Increased QOL, significant improvements found in social domains of financial and legal issues, low correlation between overall QOL and social domain of financial concerns and legal issues
Moorey et al. (2009)	Number of sessions: not described, duration: not described	Anxiety, depression, adjustment to cancer, cancer coping, social support, functional status	Lower anxiety scores over time, no effects for depression, mental adjustment to cancer, or cancer coping, reduction in perceived social support from significant other over time, but no group effect
Savard et al. (2006)	Number of sessions: 8 weekly sessions, 3 booster sessions administered every 3 weeks following the end of treatment, duration: 60-90 minutes	Depression, anxiety, insomnia, fatigue, QOL, lymphocyte, NKC, cytokines	Significant reductions in depression, anxiety, insomnia, and fatigue from pre to post-treatment, reduction not maintained between post-treatment and follow-up for depression only, significant differences in QOL at post-test or follow-up, no significant effect on the lymphocyte population, significant time effect for NKC activity NKC activity increased from post-treatment to 3 months of follow-up, NKC decreased to post-treatment level at 6-month follow-up

Table 1. Cognitive-behavioral interventions on cancer (continue)

Author	Interventions	Outcomes	Findings
Sherwood et al. (2005)	Number of sessions: 5 contacts over 8-week period, contact made every two weeks, duration: not described	Symptom severity	Lower symptom severity
Steel et al. (2007)	Number of sessions: 3-4 face-to-face sessions, 5-6 telephone sessions, duration: not described	HRQL, PWB, FWB, SWB, EWB, GQOL, depression, anxiety, PBL, survival	HRQL, reduction in PWB and FXW scores, increase in SWB, EWB, FWB, and GQOL, reductions in depression and anxiety, increase in PBLs, longer survival

QOL: Quality of life; PWB: Physical well-being; SWB: Social well-being; UP: Usual pain; WP: Worse pain; SOM: Sense of meaning; PF: Psychological functioning; EWB: Emotional well-being; SPS: Social problem solving; NKC: Natural killer cells; FXW: Functional well-being; FWB: Family well-being; HRQL: Health-related quality of life; PBL: Peripheral blood leukocytes; GQOL: Global quality of life

Controlling every aspect of the study ensures that all confounding factors that might influence the relationships between the variables of interest are controlled, which is one of the hallmarks of an RCT design. It is challenging to identify the actual intervention because descriptions of the frequency and length of interventions vary widely. In other words, it is challenging to estimate the reached dose by drawing parallels between pharmacological studies. Patient-centered interventions that are individualized or adapted to the particular traits or requirements of the patient or family are promoted as the gold standard in oncology literature (Lauver et al., 2002). The design of an appropriate intervention takes into account a variety of factors that are important to a particular person, such as a particular symptom or concern, the desired number and duration of sessions, race and ethnicity, or gender Kwekkeboom, Abbott-Anderson & Wanta, 2010). Three studies that tested a cognitive-behavioral intervention with a focus on symptom management or participant-selected areas of concern were included in this review (Steel, Nadeau, Olek, & Carr, 2007; Sherwood et al., 2005; Henry et al., 2010). For instance, in one of the studies included in this review, participants were given the option to decide on the number (ranging from 1 to 4) and length of individual sessions with a psychologist (Henry et al., 2010). Due to a lack of standardization, dependent interventions may increase the introduced bias and reduce the study's statistical significance.

To successfully navigate the physical, emotional, spiritual, and psychosocial challenges of living with advanced cancer, one must develop skills that are specific to their needs. A minimum of one physical, emotional, or spiritual outcome variable was measured in each study included in this review. Key outcomes included physical results, symptom severity, and pain level. The most frequently encountered ones were physical symptoms or closely related ideas, like symptom severity. Pain intensity was the most frequent symptom treatment outcome (Bakitas et al., 2009; Keefe et al., 2005; Sherwood et al., 2005). The effect of interventions on other physical symptoms as well, such as shortness of breath (McMillan & Small, 2007; Sherwood et al., 2005), constipation (McMillan & Small, 2007; Sherwood et al., 2005), insomnia and fatigue (McMillan & Small, 2007; Savard et al., 2006), nausea, vomiting, and anorexia (McMillan & Small, 2007) were evaluated. Pre- and post-treatment differences in symptom management were complex. Participants in review studies saw decreases in symptom distress, fatigue, and insomnia, on the one hand (McMillan & Small, 2007; Sherwood et al., 2005; Savard et al., 2006). In contrast, patients in other studies in this review did not experience improvement in symptom severity or level of pain or dyspnea (Bakitas et al., 2009; Keefe et al., 2005; McMillan & Small, 2007). For example, McMillan and Small (2007) reported findings from their problem-solving intervention designed to help home caregivers improve patient symptom management outcomes (McMillan & Small, 2007).

Discussion

The evidence supporting the use of cognitive-behavioral interventions in patients with cancer was examined critically in this article. In conducting this review, we found four main problems: (1) there are few RCTs of cognitive-behavioral interventions for patients with cancer, (2) most studies did not find treatment effects to be statistically significant, (3) study methods are not consistently described, and (4) the samples' racial/ethnic diversity is very low. The discussion of each of these subjects will follow.

Regarding the first concern, we discovered a dearth of RCTs of cognitive-behavioral treatments for patients with cancer. An investigator who is thinking about running an RCT in this population should approach randomization with serious ethical reservations. One of the characteristics of an RCT is random assignment to an experimental or control group. This means that while all participants will receive the standard of care, only those in the experimental group will receive the intervention. Patients with advanced disease have a variety of needs; thus, it seems unethical to refuse treatment (even an experimental treatment), especially in the case of patients with cancer who are hospitalized. Although the RCT with an experimental and control group is the gold standard (Lepore & Coyne, 2006), it is possible that a study like Breitbart et al. (2010), which was included in this review and compared the efficacy of two interventions to standard care, will help to resolve this issue.

In most of the studies, the treatment effects were not statistically significant, which relates to the second problem. This article explains how various outcomes are impacted by cognitive behavioral interventions (immunological, physical, emotional, spiritual, financial, and legal). Cognitive-behavioral interventions may have a therapeutic impact on particular outcomes because each type of CBI has unique mechanisms that are theorized to enhance coping or symptom management (Skinner & Morse, 1958; Folkman & Lazarus, 1980). Other authors discovered inconsistent statistically significant results (Lepore & Coyne, 2006; Chambers, Pinnock, Lepore, Hughes, & O'Connell, 2011). Significant tests, in terms of statistics, ranged from 22% for depression to 28% for overall effect (Lepore & Coyne, 2006).

The third problem is that published studies have not consistently presented the content, length, and frequency of interventions. Our ability to interpret the study results was significantly hampered by the sparse description of the intervention dose. The literature has identified similar dangers to the internal validity of studies of cognitive-behavioral interventions, such as Devine's review of a psychoeducational intervention for pain management of patients with cancer (Devine & Westlake, 1995).

The lack of racial diversity among the study subjects chosen for review was the fourth problem that was found. Notably, some of the studies included in this review lacked information on the racial makeup of the sample. Asians, Hispanics, and African Americans have not been adequately represented in clinical trials to assess the efficacy of interventions for these populations. In a systematic review of psychosocial interventions for men with prostate cancer, Chambers et al. (2011) also noted a lack of racial diversity. An essential component of providing care for people with cancer is creating studies that take into account the needs of individuals from various racial groups.

RCTs for evaluating cognitive-behavioral treatments for patients with cancer should continue, with particular advanced cancer populations' feasibility and effectiveness being carefully taken into account. People with lower functional status can be tested for the efficacy of cognitive-behavioral interventions using appropriate and well-designed quasi-experimental or comparative designs if the proposal of an RCT raises ethical and methodological concerns in these individuals. In the majority of studies, treatment effects were not statistically significant. To increase confidence in interpreting the therapeutic effects of cognitive-behavioral interventions, future research studies should specifically outline the content, duration, and frequency of the intervention and look at the connection between different therapeutic doses and patient/family outcomes. Finally, there was little racial/ethnic diversity in the study samples outlined in this review. Recent United States (US) census data reveal that our population's racial makeup is shifting. People who self-identify as belonging to an ethnic or racial minority will rise over the next 20 to 30 years, particularly among Hispanics. The impact of cognitive-behavioral interventions on individuals, couples, and groups of diverse racial/ethnic groups will need to be tested in research studies, and if necessary, appropriate interventions will be more culturally appropriate to create cognitive-behavioral interventions. This is because there are significant demographic changes occurring globally.

Conclusion

We evaluated RCTs critically as well as the efficacy of cognitive-behavioral interventions in patients with cancer. There is a gap in the current body of knowledge regarding the effectiveness of cognitive-behavioral interventions for patients with cancer. Major obstacles made it difficult to interpret the results of cognitive-behavioral interventions. This article has looked at the internal validity of these studies. From diagnosis to care at the end of life, those who are living with cancer need support. To test interventions that will enhance patient and caregiver outcomes for patients with cancer, well-designed studies are required.

Conflict of Interests

Authors have no conflict of interests.

Acknowledgments

None.

References

Bakitas, M., Lyons, K. D., Hegel, M. T., Balan, S., Brokaw, F. C., Seville, J. et al. (2009). Effects of a palliative care intervention on clinical outcomes in patients with advanced cancer: the Project ENABLE II randomized controlled trial. *JAMA., 302*(7), 741-749. doi:302/7/741 [pii];10.1001/jama.2009.1198 [doi]. Retrieved from PM:19690306

Bandura, A. (1977). Self-efficacy: Toward a unifying theory of behavioral change. *Psychol Rev*, 84(2), 191–215.

Breitbart, W., Rosenfeld, B., Gibson, C., Pessin, H., Poppito, S., Nelson, C. et al. (2010). Meaning-centered group psychotherapy for patients with advanced cancer: a pilot randomized controlled trial. *Psychooncology., 19*(1), 21-28. doi:10.1002/pon.1556 [doi]. Retrieved from PM:19274623

Cao, W., Chen, H. D., Yu, Y. W., Li, N., & Chen, W. Q. (2021). Changing profiles of cancer burden worldwide and in China: a secondary analysis of the global cancer statistics 2020. *Chin.Med J (Engl.), 134*(7), 783-791. doi:10.1097/CM9.0000000000001474 [doi];00029330-202104050-00005 [pii]. Retrieved from PM:33734139

Chambers, S. K., Pinnock, C., Lepore, S. J., Hughes, S., & O'Connell, D. L. (2011). A systematic review of psychosocial interventions for men with prostate cancer and their partners. *Patient.Educ Couns., 85*(2), e75-e88. doi:S0738-3991(11)00039-5 [pii];10.1016/j.pec.2011.01.027 [doi]. Retrieved from PM:21334159

Codd, R. T. I. Twohig, M. P., Crosby, J. M., & Enno, A. (2011). Treatment of three anxiety disorder cases with acceptance and commitment therapy in a private practice. *J Cogn Psychother*, 25(3), 203–217.

de, Han J., Verheecke, M., Van, C. K., Van, C. B., Shmakov, R. G., Mhallem, G. M. et al. (2018). Oncological management and obstetric and neonatal outcomes for women diagnosed with cancer during pregnancy: a 20-year international cohort study of 1170 patients. *Lancet Oncol., 19*(3), 337-346. doi:S1470-2045(18)30059-7 [pii];10.1016/S1470-2045(18)30059-7 [doi]. Retrieved from PM:29395867

Devine, E. C. (2003). Meta-analysis of the effect of psychoeducational interventions on pain in adults with cancer. *Oncol.Nurs Forum.*, 30(1), 75-89. doi:10.1188/03.ONF.75-89 [doi]. Retrieved from PM:12515986

Devine, E. C., & Westlake, S. K. (1995). The effects of psychoeducational care provided to adults with cancer: meta-analysis of 116 studies. *Oncol.Nurs Forum., 22*(9), 1369-1381. Retrieved from PM:8539178

Folkman, S., & Lazarus, R. S. (1980). An analysis of coping in a middle-aged community sample. *J Health Soc Behav, 21*(3), 219-239. Retrieved from PM:7410799

Goodwin, P. J., Leszcz, M., Ennis, M., Koopmans, J., Vincent, L., Guther, H. et al. (2001). The effect of group psychosocial support on survival in metastatic breast cancer. *N.Engl.J Med, 345*(24), 1719-1726. doi:10.1056/NEJMoa011871 [doi];345/24/1719 [pii]. Retrieved from PM:11742045

Henry, M., Cohen, S. R., Lee, V., Sauthier, P., Provencher, D., Drouin, P. et al. (2010). The Meaning-Making intervention (MMi) appears to increase meaning in life in advanced ovarian cancer: a randomized controlled pilot study. *Psychooncology., 19*(12), 1340-1347. doi:10.1002/pon.1764 [doi]. Retrieved from PM:20878857

Hofmann, S. G., Asnaani, A., Vonk, I. J., Sawyer, A. T., & Fang, A. (2012). The Efficacy of Cognitive Behavioral Therapy: A Review of Meta-analyses. *Cognit Ther Res, 36*(5), 427-440. doi:10.1007/s10608-012-9476-1 [doi]. Retrieved from PM:23459093

Keefe, F. J., Ahles, T. A., Sutton, L., Dalton, J., Baucom, D., Pope, M. S. et al. (2005). Partner-guided cancer pain management at the end of life: a preliminary study. *J Pain.Symptom.Manage., 29*(3), 263-272. doi:S0885-3924(04)00568-8 [pii];10.1016/j.jpainsymman.2004.06.014 [doi]. Retrieved from PM:15781177

Kwekkeboom, K. L., Abbott-Anderson, K., & Wanta, B. (2010). Feasibility of a patient-controlled cognitive-behavioral intervention for pain, fatigue, and sleep disturbance in cancer. *Oncol.Nurs Forum., 37*(3), E151-E159. doi:A51514G2874003R7 [pii];10.1188/10.ONF.E151-E159 [doi]. Retrieved from PM:20439200

Lauver, D. R., Ward, S. E., Heidrich, S. M., Keller, M. L., Bowers, B. J., Brennan, P. F. et al. (2002). Patient-centered interventions. *Res Nurs Health, 25*(4), 246-255. doi:10.1002/nur.10044 [doi]. Retrieved from PM:12124719

Lawless, M. H., Harrison, K. A., Grandits, G. A., Eberly, L. E., & Allen, S. S. (2015). Perceived stress and smoking-related behaviors and symptomatology in male and female smokers. *Addict.Behav, 51*, 80-83. doi:S0306-4603(15)00267-1 [pii];10.1016/j.addbeh.2015.07.011 [doi]. Retrieved from PM:26240941

Lepore, S. J., & Coyne, J. C. (2006). Psychological interventions for distress in cancer patients: a review of reviews. *Ann.Behav Med, 32*(2), 85-92. doi:10.1207/s15324796abm3202_2 [doi]. Retrieved from PM:16972802

Meyers, F. J., Carducci, M., Loscalzo, M. J., Linder, J., Greasby, T., & Beckett, L. A.

(2011). Effects of a problem-solving intervention (COPE) on quality of life for patients with advanced cancer on clinical trials and their caregivers: simultaneous care educational intervention (SCEI): linking palliation and clinical trials. *J Palliat.Med*, 14(4), 465-473. doi:10.1089/jpm.2010.0416 [doi]. Retrieved from PM:21413846

McMillan, S. C., & Small, B. J. (2007). Using the COPE intervention for family caregivers to improve symptoms of hospice homecare patients: A clinical trial. *Oncol.Nurs Forum., 34*(2), 313-321. doi:44405556677W33K2 [pii];10.1188/07.ONF.313-321 [doi]. Retrieved from PM:17573295

Miller, J. J., Frost, M. H., Rummans, T. A., Huschka, M., Atherton, P., Brown, P. et al. (2007). Role of a medical social worker in improving quality of life for patients with advanced cancer with a structured multidisciplinary intervention. *J Psychosoc.Oncol., 25*(4), 105-119. doi:10.1300/J077v25n04_07 [doi]. Retrieved from PM:18032268

Moher, D., Schulz, K. F., & Altman, D. G. (2001). The CONSORT statement: revised recommendations for improving the quality of reports of parallel group randomized trials. *BMC Med Res Methodol, 1*(1), 2.

Moorey, S., Cort, E., Kapari, M., Monroe, B., Hansford, P., Mannix, K. et al. (2009). A cluster randomized controlled trial of cognitive behaviour therapy for common mental disorders in patients with advanced cancer. *Psychol Med, 39*(5), 713-723. doi:S0033291708004169 [pii];10.1017/S0033291708004169 [doi]. Retrieved from PM:18761755

Porter, L. S., & Keefe, F. J. (2011). Psychosocial issues in cancer pain. *Curr Pain.Headache.Rep., 15*(4), 263-270. doi:10.1007/s11916-011-0190-6 [doi]. Retrieved from PM:21400251

Roberts, A. W., Davids, M. S., Pagel, J. M., Kahl, B. S., Puvvada, S. D., Gerecitano, J. F. et al. (2016). Targeting BCL2 with venetoclax in relapsed chronic lymphocytic leukemia. *N.Engl. J Med, 374*(4), 311-322. doi:10.1056/NEJMoa1513257 [doi]. Retrieved from PM:26639348

Savard, J., Simard, S., Giguere, I., Ivers, H., Morin, C. M., Maunsell, E. et al. (2006). Randomized clinical trial on cognitive therapy for depression in women with metastatic breast cancer: psychological and immunological effects. *Palliat.Support Care, 4*(3), 219-237. doi:10.1017/s1478951506060305 [doi]. Retrieved from PM:17066964

Schettini, F., Braso-Maristany, F., Kuderer, N. M., & Prat, A. (2022). A perspective on the development and lack of interchangeability of the breast cancer intrinsic subtypes. *NPJ Breast.Cancer, 8*(1), 85. doi:10.1038/s41523-022-00451-9 [doi];10.1038/s41523-022-00451-9 [pii]. Retrieved from PM:35853907

Schienle, A., Kochel, A., & Leutgeb, V. (2011). Frontal late positivity in dental phobia: a study on gender differences. *Biol Psychol, 88*(2-3), 263-269. doi:S0301-0511(11)00199-2 [pii];10.1016/j.biopsycho.2011.08.010 [doi]. Retrieved from PM:21889569

Sherwood, P., Given, B. A., Given, C. W., Champion, V. L., Doorenbos, A. Z., Azzouz, F. et al. (2005). A cognitive behavioral intervention for symptom management in patients with advanced cancer. *Oncol.Nurs Forum., 32*(6), 1190-1198. doi:10.1188/05.ONF.1190-1198 [doi];5K0V3438X82P2660 [pii]. Retrieved from PM:16270114

Skinner, B. F., & Morse, W. H. (1958). Fixed-interval reinforcement of running in a wheel. *J Exp.Anal.Behav, 1*(4), 371-379. doi:10.1901/jeab.1958.1-371 [doi]. Retrieved from PM:16811236

Steel, J. L., Nadeau, K., Olek, M., & Carr, B. I. (2007). Preliminary results of an individually tailored psychosocial intervention for patients with advanced hepatobiliary carcinoma. *J Psychosoc.Oncol., 25*(3), 19-42. doi:10.1300/J077v25n03_02 [doi]. Retrieved from PM:19341012