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Behavioral, Psychological, Educational, and Vocational Interventions to Facilitate Employment Outcomes for Cancer Survivors: A Systematic Review

Carlton J. Fong, Kathleen M. Murphy, John D. Westbrook,
Minda M. Markle



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Corresponding author	John D. Westbrook SEDL 4700 Mueller Blvd. Austin, TX 78723 USA E-mail: john.westbrook@sedl.org

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The Campbell Collaboration
P.O. Box 7004 St. Olavs plass
0130 Oslo, Norway
www.campbellcollaboration.org

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Abstract

BACKGROUND

In the United States, an estimated 1.5 million people are diagnosed annually with some type of cancer (American Cancer Society, 2011). Work is an important stabilizing factor for cancer survivors (Arnold, 1999). De Boer and colleagues (2009) identified a rate of 33.8% unemployment among cancer survivors beyond the age of 18 compared to 15.2% among a healthy international control population. Greater awareness of the job-related and workplace issues that cancer survivors face can lead to more comprehensive rehabilitation plans and recovery (Centers for Disease Control, 2011; Nathan, Hayes-Lattin, Sisler, & Hudson, 2011). Although various recent interventions have been developed to address unemployment among cancer survivors, these have not yet been systematically evaluated.

OBJECTIVE

The objective of this systematic review is to examine experimental and quasi-experimental studies about interventions that (i) include one or more behavioral, psychological, educational, or vocational components, (ii) involve cancer survivors aged 18 years or older, and (iii) assess intervention outcomes on employment outcomes. The aims are both to describe the variety of interventions that have been studied using rigorous methods and to estimate intervention effects.

SEARCH STRATEGY

We used electronic search techniques of 27 computerized databases to conduct a comprehensive search. Keywords used were relevant terms from four categories: population, treatment, domain, and design. We identified grey literature through electronic searches of popular search engines, unpublished dissertations/theses, and cancer-related organizations and conferences. In addition, we searched reference lists from included individual studies for potential studies to consider. The dates of the last search for electronic databases and grey literature were November 2013 and October 2012, respectively.

SELECTION CRITERIA

We employed a two-stage process to determine inclusion or exclusion of studies: (1) title and abstract stage and (2) full text stage. Participants needed to be cancer survivors 18 years of age or older. Interventions were included if they measured gainful employment, return to work, wages, or hours worked as an outcome. Interventions were behavioral, psychological, educational, or vocational in nature, including workshops, training, or counseling targeted towards employment initiation, return-to-work, or decreasing absenteeism and use of work disability or sick leave. Interventions included an element apart from medical or physical treatment (e.g., exercise, surgery, pharmaceutical treatment). Studies with a research design of randomized controlled trial or quasi-experimental study were included.

DATA COLLECTION AND ANALYSIS

The combined electronic search, hand searches, and examination of the grey literature produced a total of 20,249 citations. Of these studies, a total of 70 citations were advanced for collection of a full text copy of the study when either one of the two independent reviewers agreed it appeared to meet the inclusion criteria. Twelve studies met the inclusion criteria.

The results of the studies were synthesized in a random-effects meta-analysis using odds ratio effect sizes.

RESULTS

We found 12 studies evaluating the effects of psychosocially-related interventions on the employment of cancer survivors ($N = 2151$). Our results provide promising evidence that the included interventions may improve employment status ($OR = 1.71$, 95% confidence interval (CI) = 1.26 to 2.32) for cancer survivors. For RCTs ($k = 6$), the weighted mean effect size for employment status was $OR = 1.44$ (CI = 0.99 to 2.09), favoring the intervention groups. The mean odds ratio of 1.44 translates to an employment rate of about 68% for intervention participants compared to a baseline 60% for comparison group participants. For QEDs ($k = 6$), the weighted mean effect size for employment status was $OR = 2.18$ (CI = 1.32 to 3.60), also favoring the intervention groups. The mean odds ratio of 2.18 for the quasi-experimental studies translates to an employment rate of about 77% for intervention participants, compared to the baseline rate of 60% for the comparison group participants. Although the mean effect size from QEDs was larger than that from the RCTs, there is no significant difference between the two types of experimental designs ($p = 0.19$).

There was no evidence of an effect on the number of hours worked ($OR = 0.89$, CI = 0.22 to 1.52) or number of sick leave days ($OR = 1.18$, CI = 0.81 to 1.71). Overall, the

assessment of the risk of bias was high, and conclusions about the effectiveness of the included interventions should be interpreted with caution.

AUTHORS' CONCLUSIONS

This review highlights the positive effect psychosocial interventions may have on employment outcomes for cancer survivors. However, the methodological shortcomings of the included studies overall makes it likely that there is bias in the results and too few studies to provide sufficiently strong evidence to recommend particular practices. This review brings attention to the need for additional rigorous studies in this area, in particular, randomized controlled trials with more detailed reporting of data and study design and methodology.

1 Background

In the United States, an estimated 1.5 million people are diagnosed annually with some type of cancer (American Cancer Society, 2011). Today, survivorship after diagnosis is higher than it has ever been: as of January 2008, about 11.9 million individuals in the United States had a history of a cancer diagnosis (Howlander et al., 2011). Drawing on more recent estimates from the working-age population in particular, there are over 7 million cancer survivors in the United States between the ages of 15 and 69 years, and the number is expected to grow (American Cancer Society, 2012). The issues affecting cancer survivorship are complex, particularly when one considers the impact of this disability on employment specifically. De Boer and colleagues (2009) identified a rate of 33.8% unemployment among cancer survivors beyond the age of 18 compared to 15.2% among a healthy international control population. Work is an important stabilizing factor for cancer survivors (Arnold, 1999). Greater awareness of the workplace issues that cancer survivors face can lead to more comprehensive rehabilitation plans and recovery (Centers for Disease Control, 2011; Nathan, Hanes-Lattin, Sisler, & Hudson, 2011).

Cancer survivors face difficulties with activities of daily living, including employment, not only while their cancer is active, but for years afterwards. Mehnert, de Boer, and Feuerstein (2013) have developed a conceptual framework that summarizes various challenges to employment cancer survivors face. They divide these into three domains: individual and interpersonal factors; the short-, long-, and late-effects of cancer and treatments; and the work environment. The individual and interpersonal factors are described as “sociodemographics, socioeconomic status, educational professional training, life stage, personality, coping strategies, problem-solving skills, motivation, meaning of work, and social supports” (Mehnert et al., 2013, p. 2154). These factors affect the employment outcomes for any individual in the workplace, but cancer survivors have to rely more heavily on these various forms of individual-level resources to sustain employment. Blinder and colleagues (2011) noted that such challenges are even more difficult to overcome for people in low-income occupations.

Secondly, the effects of cancer specifically, whether short-, long-, or late-term, can be in the realm of “health status/comorbidity, continuity of care, quality of life, functional impairments, symptom burden, emotional and social well-being, change in identity and role functioning, social reintegration” (Mehnert et al., 2013, p. 2154). These barriers to employment all relate, in direct or indirect ways, to a person’s

health, both mental and physical, and well-being, and obviously can dramatically affect an individual's participation in the work setting. For example, treatment side effects such as alopecia (hair loss; Münstedt, Manthey, Sachsse, & Vahrson, 1997) or 'chemo brain' (cognitive functioning deficits; Staat & Segatore, 2007) may affect interpersonal relationships or workplace functioning.

A third domain constitutes work environment traits that can influence survivors' work outcomes. These traits range from the conditions, demands, and overall climate of the work setting to the accommodation and flexibility of the employer (Mehnert et al., 2013). Cancer symptoms and treatment can necessitate changes in work conditions, such as reducing demands or changing work hours to accommodate treatment. In 2008, Title I of the Americans with Disabilities Act (ADA) was amended to include "major bodily functions" that interfere with daily living in the definition of disability, underscoring the disability classification and associated job protections to cancer survivors that the law had always offered to them. Analysis of claims filed show that cancer survivors more often have issues with job termination and terms of employment than employees with other impairments (Feuerstein, Luff, Harrington, & Olsen, 2007).

1.1 THE INTERVENTION

This review focused on identifying interventions with behavioral, psychological, educational, or vocational content that aim to facilitate cancer survivors' employment outcomes, including a) employment status, b) return-to-work, c) absenteeism, and d) time spent on work disability or sick leave. Interventions of interest included education, training, psychological support, environmental adjustments or accommodations, flexible or job-sharing work conditions, or job search and placement assistance. We were also interested in interventions that did not target employment specifically, but included it as a related outcome among those measured. These studies give insight into what practices might be adapted and included in new interventions for the explicit purposes of promoting employment.

1.1.1 How the Intervention Might Work

It was anticipated that the literature would identify a broad set of interventions with behavioral, psychological, educational, or vocational components. Pathways of effects to the outcomes were expected to vary widely along with the setting, training of the facilitator, and whether delivered to individuals or groups by individuals or teams.

Approaches to addressing strain on individual and interpersonal resources—one of the domains Mehnert, de Boer, and Feuerstein (2013) identified—would include vocational components. Survivors are four times more likely to be employed when they receive employment assistance and support, such as job-hunting services or on-the-job training (Strauser et al., 2010). Basic components of interventions that

United States-based vocational rehabilitation (VR) agencies use generally include diagnosis and vocational assessment, counseling, training, provision of accommodations, job placement, and post-employment services (Waddell, Burton, & Kendall, 2008). This review was designed to include studies of interventions that measured outcomes related to participants' search for new jobs but often dealt with issues of job retention. In an example of how VR, as a multi-component intervention, can be tailored to meet the needs of these two groups, Chiu and colleagues (2013) studied recipients of state VR services who had cancer, and their chief finding was that those who were employed used different VR services than those who were not employed: "While some services were indeed used by a large portion of all clients such as assessment, diagnosis and treatment of impairments and VR counseling and guidance, which were major needs by over half applicants in the current study—other services were contingent on the clients' employment status" (Chiu et al., 2013, p. 7). Employed clients needed services to support work adjustment and accommodation, such as diagnosis, treatment, "rehabilitation technology, disability-related augmentative skills training, technical assistance services, on-the-job supports and basic academic, remedial or literacy training" (Chiu et al., 2013, p. 7). Especially because there were significantly lower educational levels compared to the employed group, unemployed clients needed a wide variety of vocational rehabilitation services such as the search and placement process to obtain a job, and then job readiness training. A pilot randomized controlled trial of VR services among women with breast cancer following surgery is currently underway in the United Kingdom, though in these countries VR is more heavily oriented toward interventions that focus on health (Kyle et al., 2011) and psychological counseling.

Approaches to addressing health and well-being include components targeting behavioral change and/or alleviation of physical symptoms or emotional issues, with a focus on symptom reduction and improvement in related quality of life. A review of psycho-social interventions in oncology noted that treatment options for cancer patients vary due to the diversity among types of cancer and their treatment options, but that they included "counseling, cognitive-behavioral methods, information and educational treatments and complementary therapies" (Whatley & Milne, 1998, p. 1). Similar to the studies located in a meta-analysis of psychosocial interventions with adult cancer survivors conducted by Meyer and Mark (1995), these intervention studies did not measure employment. Another intervention targeting barriers in this domain is a tool currently being developed and evaluated at the University of Wisconsin-Madison called "Work ability Improvement through Symptom management and Ergonomic strategies" (WISE). The tool is a website that guides breast cancer survivors through questions that help determine how to address ongoing symptoms, particularly shoulder pain, and improve ergonomics at their offices (Garrett, 2012; National Rehabilitation Information Center, 2012, p. I-37). Educational interventions also seek to overcome barriers in this domain, such as a group educational and discussion group intervention for men with prostate cancer

(Lepore, Helgeson, Eton, & Schulz, 2003). Another example is the cancer-related fatigue intervention trial CAN-FIT, that sought to reduce severity of fatigue among survivors who have had radiotherapy by sharing a handbook, presentations, a goal-setting sheet, and progress diary that aimed to increase participants' knowledge about radiotherapy side effects and strategies to reduce fatigue (Purcell, Fleming, Burmeister, Bennett, & Haines, 2011).

Approaches to addressing barriers to employment that express themselves in work environments are primarily educational. Several organizations, for example including some that belong to the United States-based National Cancer Legal Services Network (www.nclsn.org), provide training and information to both employers and survivors. Publications and other information on various Web sites offer information about cancer-related employment issues and how to address them through greater awareness of cancer survivors' needs for accommodation. Examples of such informational resources are published by Cancer and Careers in the "At Work" section of their web site (see www.cancerandcareers.org/en/at-work) and Hoffman (2012). The American Cancer Society also has an employer-oriented publication (American Cancer Society, 2014). While increasingly common, to date the efficacy of this information provision has not been studied formally.

Given that the typical intervention includes more than one component targeting barriers to employment that straddle the domains outlined above, it is not surprising that a common approach to return-to-work interventions for cancer survivors (a) emphasizes the involvement of multidisciplinary teams (Fleischman, Retkin, Brandfield, & Braun, 2006; Retkin, Antoniadis, Pepitone, & Duval, 2013; Vonk Noordegraaf et al., 2012) or (b) at least seeks to improve communication among employers, survivors, and medical providers (Nieuwenhuijsen, Bos-Ransdorp, Uitterhoeve, Sprangers, & Verbeek, 2006; Tamminga, de Boer, Verbeek, & Frings-Dresen, 2010). Many interventions seek to meet a diverse set of survivors' needs, using a variety of intersecting mechanisms.

1.2 CONTRIBUTION OF THE REVIEW

According to one systematic review of employment and work-related issues in cancer survivors, employer accommodation, flexible work, counseling, training and rehabilitation, educational levels, fewer physical symptoms, continuity of care, younger age, and male gender are associated with more positive work outcomes (Mehnert, 2011). However, little is known about how these factors relate to which interventions and how these might be most effective at helping cancer survivors to become employed. Gensby et al. (2012) led a systematic review of workplace disability management programs that focused on return-to-work, but consistent with Tamminga and colleagues' (2010) review, found none that focused on cancer. In addition, there are few published instruments relevant to evaluating interventions related to cancer survivorship and work (Ladehoff, Sturm, & Mehnert, 2013).

In 2011, de Boer and colleagues conducted a Cochrane review of medical, psychological, and physical interventions that targeted return-to-work outcomes with cancer survivors. Although they found a number of studies of interventions that enhanced return-to-work, none of the included studies were interventions that specifically targeted vocational rehabilitation, such as job-related skills, interviewing, etc. A contribution of our review is the inclusion of new literature after the de Boer (2011) review was published (e.g., Tamminga et al. 2013) and additional employment outcomes such as number of hours worked.

Understanding the impact on employment of interventions that include behavioral, psychological, educational, and/or vocational content, as compared to medical, pharmaceutical, or surgical treatments that a narrower range of providers are certified to deliver, could promote cancer survivors' employment and yield greater rewards for employees and employers alike (Centers for Disease Control, 2011; Kyle et al., 2011). Including interventions that measure, but do not necessarily target, employment will allow for the findings of this review to be applied to a broader set of theories of change. For example, Purcell et al. (2011) did not target employment as an outcome but did report employment status allowing the authors to include this study. Researchers designing impact evaluations of new interventions might choose to do longer-term follow-up, assume that the intervention intensity would need to be increased, or measure whether an intervention targeting an assumed barrier might inadvertently increase awareness of it and so contribute to its consequences (i.e., discussing fatigue might make people more concerned about it and more likely to avoid taxing their energies by employment until they feel energetic enough to return-to-work). This review demonstrates that employment outcomes can be included in data collection, beneficially allowing further understanding of the differences in successful employment outcomes across various disability conditions that differ by severity and range of limitations.

This review conducted a broader search that includes more databases and expanded employment-related outcomes (such as number of hours worked and wages) than those done on similar topics previously.

2 Objective

The objective of this review is to examine experimental and quasi-experimental studies about interventions that (i) include one or more behavioral, psychological, educational, or vocational components, (ii) involve cancer survivors aged 18 years or older, and (iii) assess intervention effects on employment outcomes. The aims are both to describe the variety of interventions that have been studied using rigorous methods and to estimate intervention effects.

3 Methods

3.1 TITLE REGISTRATION AND REVIEW PROTOCOL

The title for this systematic review was approved by the Campbell Collaboration on 20 October 2011. The review protocol was approved on 11 November 2013 (Fong, Murphy, Westbrook, & Markle, 2013). The title registration and protocol are available at: <http://www.campbellcollaboration.org/lib/project/225/>.

Deviations from the protocol are described in the following sections and highlighted here:

- We expanded the inclusion criteria to encompass interventions not focused on developing employment-specific skills but contained behavioral, psychological, or social components necessary for gainful employment;
- We eliminated planned moderator/subgroup analyses due to the small number of included studies; and
- We modified the effect size metric to the odds ratio for all outcomes.

3.2 CRITERIA FOR INCLUSION AND EXCLUSION OF STUDIES IN THE REVIEW

3.2.1 Participants

The participant samples were required to be (a) adults aged 18 years or older and (b) cancer survivors (i.e., had a past or present cancer diagnosis which occurred while the individual was aged 18 years or older). Studies of populations that included, but were not limited to, cancer survivors were not excluded if the employment outcomes of the participants who were cancer survivors were reported independently from those of other participants. Studies of adults who were survivors of pediatric cancer were excluded, since these individuals may have participated in interventions as children, such as high school transition-to-work programs to which adult-onset populations could not have participated in, but which could affect employment outcomes. Study participants eligible for inclusion were individuals diagnosed with any type of cancer. Study participants with co-morbidities were not excluded.

Participants not employed at the time of the study intervention were the focus of this review as return-to-work and gainful employment were primary outcomes; however, employment maintenance is an important concern and individuals who were employed prior to an intervention study were not excluded in this review. Reviewers did not exclude studies in which the participant pool included both participants who had an employment history and those who did not.

3.2.2 Intervention

Included studies addressed the effectiveness of a behavioral, psychological, educational, or vocational intervention or component of an intervention for cancer survivors that facilitated their employment outcomes, including employment initiation, return-to-work, or decreasing absenteeism and use of work disability or sick leave.

Eligible interventions addressed social, behavioral, cognitive, or specific employment skills related to the acquisition and maintenance of employment among the study participants. Interventions could involve relatively specific and structured experiences of VR designed to support employment placement, for example, providing guidance in completion of applications, résumés, and engaging in interviews; shaping of work skills and appropriate employment setting social skills; or teaching of appropriate work-related communication skills. Furthermore, interventions could address more general psychological or behavioral aspects of functioning that can facilitate employment, such as coping skills. Examples are behavioral treatments such as self-care behaviors to reduce fatigue; behavioral therapies that help survivors cope with their scars or other issues associated post-surgery; psychological interventions through individual or telephone counseling that assist with adjusting to a cancer diagnosis; lecture-based educational interventions on cancer survivorship; and, vocational interventions through supported employment from a VR agency that provide job supports, interview training, etc.

Interventions could be multidisciplinary, incorporating physical and medical treatment and educational training. For example, an intervention could include multiple components such as a vocational training workshop, exercise, and yoga.

Interventions to be included in this review were often divergent in their scope and area of focus, e.g., including components that promoted psychological, physical, and work-oriented outcomes because of the particular needs of the subject group. This was expected due to the wide variation in health-related outcomes related to improving cancer survivors' overall well-being. To accommodate this need and appropriate variation in interventions, studies for inclusion addressed psychological, behavioral, medical and/or skill-oriented interventions with an employment outcome. Therefore, if there were two studies that evaluated the impact of VR, one with an employment outcome and the other with a quality of life outcome, only the first was included, and the latter excluded. Interventions must have included an element apart from medical or physical treatment (e.g., exercise, surgery,

pharmaceutical treatment). One reason for excluding interventions with solely medical components is our focus on VR agencies as our primary audience and, as a result, focused on programs that rehabilitation organizations can feasibly implement. Interventions of any length or duration were included provided adequate description was given.

3.2.3 Research Design

Included studies used a randomized controlled trial (RCT) design, quasi-experimental equivalent and non-equivalent comparison design, or quasi-experimental design that employed regression discontinuity. Quasi-experimental designs with equivalent groups formed by matching or equating, or non-equivalent groups without matching or equating, involved, for example, comparing the employment rate of a treatment group compared with the employment rate of a general population of cancer survivors that did not receive the intervention.

3.2.4 Outcome Measures

Eligible studies provided evidence for the effect of the intervention on employment status and/or related outcomes such as disability onset; of time out-of-work (i.e., number of leave days taken, including sick, disability, or vacation); and/or differences in rates of employment between the intervention and comparison groups. Various other measures were used to estimate the rate of employment such as wage-earning or hours worked. These employment-related outcomes are commonly studied in the return-to-work literature and provide a more fine-grained understanding of the impact of cancer on employment (Murphy, Markle, Nguyen, & Wilkinson, 2013).

Consistent with many aspects of the definition that United States federal agencies such as the Bureau of Labor Statistics and United States Census use, this review considered study participants to be ‘employed’ if they have done at least one hour of work per week. This job could be as a paid employee or “in their own business, profession, or on their own farm.” Also considered ‘employed’ are those who were not working but who “had jobs or businesses from which they were temporarily absent because of vacation, illness, bad weather, childcare problems, maternity or paternity leave, labor-management dispute, job training, or other family or personal reasons, whether or not they were paid for the time off or were seeking other jobs” (Bureau of Labor Statistics, 2008). Because this definition includes a rather attainable threshold for “gainful” employment, the included studies operationalized employment in this regard.

3.2.5 Publication Status

Published and unpublished studies were included in the evidence pool.

3.2.6 Country of Origin and Language of Publication

Studies that were conducted in any country were eligible. We did not exclude studies reported in languages other than English, but we did not specifically search for non-English literature; however, we did search selected international databases. Non-English language studies that were retrieved or reviewed required the reviewers to obtain translation assistance from native speakers (e.g., Bottcher, 2013).

3.3 SEARCH STRATEGY FOR IDENTIFICATION OF RELEVANT STUDIES

The search strategy used for identification of relevant studies is described below. All databases search engines were last searched on November 2013. Conference programs and organizations were last searched on October 2012.

3.3.1 Electronic Searches

Studies were identified using electronic search techniques of 27 computerized databases (last search occurred in November 2013). We consulted database thesauri, where they were available, to assure that the universe of appropriate synonyms had been included in the intervention and outcome search term categories. Search terms and search strategies were modified to fit individual databases.

Databases searched included:

1. Academic One File
2. Academic Search Complete
3. Academic Source Complete
4. Business Source Complete
5. CINAHL Plus with Full Text
6. CIRRIE (Center for International Rehabilitation Research Information and Exchange Database)
7. Cochrane Central Registry of Controlled Trials
8. Ed Line and Electronic Texts in Education and Training
9. Education Full Text
10. ERIC
11. Professional Development Collection
12. ProQuest
13. ProQuest Dissertations & Theses
14. PsycINFO
15. Psychology and Behavioral Sciences Collection
16. PubMed
17. Science and Technology Collection
18. Sociological Abstracts
19. Web of Science

20. World Cat [for monographs]
21. MEDLINE
22. EMBASE
23. OSH-ROM (Occupational Safety and Health)
24. Abstracts of Review of Effectiveness (DARE)
25. ClinicalTrials.gov
26. Trialregister.nl
27. Controlled-trials.com

3.3.2 Search Terms

We included literature published between 1973 through August 2013. The rationale for the start date was that, during 1973, the United States Congress approved the Rehabilitation Services Act, catalyzing the development of VR programs and efforts to accommodate people with disabilities in the workplace. There has been some attention to occupational health internationally for over a century; for example, the International Commission on Occupation Health was founded in 1906. This date was well before scholarly work on disability management began to develop. For example, the first conference of the International Disability Management Standards Council was not held until 2002. Similarly, the field of cancer survivorship studies is relatively recent because the population of cancer survivors who had employment-related issues was small until medical advances of the late 20th century (Hewitt, Greenfield, & Stovall, 2006).

The search of databases used four sets of keywords that pertain to the population, intervention, outcomes, and study design. Search strings' keywords were customized to the particular thesaurus of each database. Keywords were connected with “and”/”or” when searching titles and abstracts. Search terms were truncated to include variations in word endings, spellings, and database indices.

The following is an example of the types of terms. Terms from the four categories were connected with “or” within each category and by “and” between categories.

1. *Population*: cancer, cancer survivor, neoplasm, leukemia
2. *Intervention*: intervention, model, program, practice, training, vocational rehabilitation, accommodation, occupational therapy
3. *Outcomes*: employment, return-to-work, job, wages, salary [Note: the terms ‘wages’ and ‘salary’ are included since they might help to locate employment-related studies, but there are not intended to be included as measure of intervention effect.]
4. *Study design*: experiment, control group, random, effect

A sample search strategy is:

((cancer* OR “cancer survivor” OR neoplasm* OR leukemia*) AND (interven* OR model* OR program* OR practice* OR train* OR “vocational rehabilitation” OR accommodat* OR “occupational therapy”) AND (employ* OR “return-to-work” OR job OR wages OR salar*) AND (experiment* OR “control group*” OR random OR effect*))

For more information on the search strategy, see Appendix A: Documentation of Search Strategies for the Systematic Review.

3.3.3 International Contacts

Our efforts to find studies from outside the United States included searching in several non-United States and international databases. This yielded studies that were reviewed in Stage 1 of the title/abstract review procedures as well as one included study (Granstam-Bjorneklett et al., 2013).

3.3.4 Grey Literature

Grey literature that is identified through electronic searches was submitted to the same inclusion criteria as other studies. A time range for these types of studies was not specified in order to maximize consideration of all relevant grey literature. Reference lists from other systematic reviews and individual studies were searched for potential studies to consider for inclusion.

We inquired with two prominent researchers in the field of vocational rehabilitation of cancer survivors about any unpublished reports or completed research activity that may have a pending report. We searched the reference lists of identified articles (ancestry search), which might have been helpful, for example, in locating dissertations and theses not identified by our database searches. Also, a search of popular search engines was conducted. Using the search strategy described earlier, we used Google, Google Scholar, and Yahoo! to uncover any relevant web materials or unpublished studies not accessible through electronic databases. In addition, searching ProQuest Dissertations and Theses allowed for opportunities to uncover relevant unpublished doctoral dissertations and masters theses.

3.3.5 Cross-referencing of Bibliographies

The references in relevant journal articles, systematic reviews, and other reports of research results were reviewed for new additions to our study pool.

3.3.6 Conference Programs and Relevant Associations

Recent conference programs and conference syntheses from relevant associations and conferences were used to identify unpublished studies eligible for review inclusion. Programs and organizational resources were searched in 2012, using the most recent conference programs or those available online. Professional organizations/events that were reviewed included:

1. American Cancer Society
2. American Institute for Cancer Research
3. American Public Health Association
4. The Centers for Disease and Control and Prevention
5. Dana-Farber Cancer Institute
6. Livestrong
7. Macmillan Cancer Support
8. The National Cancer Institute
9. National Cancer Research Institute
10. National Cancer Legal Services Network
11. National Coalition for Cancer Survivorship
12. Organisation of European Cancer Institutes
13. The University of Texas MD Anderson Cancer Center
14. Work Disability Prevention and Integration
15. The International Disability Management Standards Council

3.4 CODING PROCEDURES AND CATEGORIES

Studies were screened for inclusion/exclusion decisions at two stages, Stage 1: citation and abstract and Stage 2: full-text. The same two coders served as independent reviewers at both stages, reaching consensus on any coding discrepancies. A third party was not needed to resolve any coding difference.

3.4.1 Citation and Abstract Stage

At Stage 1, the decision for advancing the retrieved citations and abstracts to the full text stage retrieval was made independently two reviewers, discussing discrepancies to reach consensus. Decisions were based on meeting two criteria from the following questions (items a, b, c, or d) or a designation by a reviewer of ‘unsure’ (item e):

- a. Are the participants identified, described, and defined as cancer survivors?
- b. Are the participants adults who are employed or seeking employment?
- c. Is this abstract/citation about an intervention with behavioral, educational, or vocational content?
- d. Does the study report employment status or relevant time-to-event data?
- e. Unsure of meeting inclusion criteria?

3.4.2 Full-Text Level

At the Full-Text Stage 2 level, full texts of all citations advanced from Stage 1 were obtained and coded for an inclusion/exclusion decision. The decision for advancing the retrieved full-text studies to an inclusion status was made by two reviewers for

each study, independently evaluating each study. An inclusion decision for advancement to the coding stage of the process required that a study met all the criteria presented earlier. Inter-rater reliability was established prior to initiating coding activities, minimizing coding disagreements. Coders demonstrated agreement in an initial set of 2 studies at a 95% rate of agreement. When differences did arise, resolution occurred through discussion and agreement of the two reviewers.

At the Full-Text Stage 2 level, the two reviewers also recorded all excluded studies and the reason for exclusion independently. For more information see Appendix B: Reasons Stage 2 Studies were Excluded from the Systematic Review.

When multiple studies used the same sample or outcome data, the study providing the most complete information focusing on our desired intervention outcome was selected for inclusion.

Other data for extraction and coding from the primary studies included: publication source, subject characteristics, sample source, employment setting, intervention characteristics, type of employment, and outcome measurement. See Appendix C for the coding form.

3.5 ASSESSMENT OF METHODOLOGICAL QUALITY

Included studies were coded by two independent reviewers for methodological quality on dimensions that included:

- Design type
 - RCT Individual Randomized Design
 - RCT Group Randomized Design
 - Quasi-Experiment: Equivalent Comparison Design (individuals)
 - Quasi-Experiment: Equivalent Comparison Design (groups)
 - Quasi-Experiment: Nonequivalent Comparison Design (individuals)
 - Quasi-Experiment: Nonequivalent Comparison Design (groups)
 - Quasi-Experiment: Regression Discontinuity
- Unit of assignment (e.g., individual vs. group/class)
- Unit of analysis (e.g., Intention to Treat, Test only, Treated)
- Attrition from pretest to posttest
- Fidelity of implementation (e.g., following replicable program of intervention)
- Blinding of assessors/interventionists

In addition, an evaluation of the potential risk of bias of all included studies was

conducted using procedures described by Higgins & Green (2011). The five sources of potential bias include (1) selection bias, (2) performance bias, (3) detection bias, (4) attrition bias, and (5) reporting bias. Potential selection bias was assessed via examination of a study's generation of a randomized sequence or concealment of allocations before assignment. Potential performance and detection biases were examined by recording the blinding of participants, personnel, and outcome measurement. Potential attrition bias resulting from incomplete outcome data was assessed by recording attrition, exclusions, reasons for exclusions, and any re-inclusions. Lastly, we assessed potential reporting bias, i.e., whether selective outcomes were reported.

3.6 CALCULATING EFFECT SIZES

We used Comprehensive Meta-analysis software (Borenstein, Hedges, Higgins, & Rothstein, 2005) for all statistical calculations. Only studies using an experimental or quasi-experimental design were included in the data synthesis.

3.6.1 Within-study Synthesis

The measures of effect were the rate of employment, mean number of leave days taken since disability onset, and mean number of hours worked. If these were not reported directly, they were calculated from the outcomes that were reported.

We employed a shifting unit of analysis approach (Cooper, 1998), which involves coding as many effect sizes from each study as exist as a result of variations in characteristics of the manipulation, sample, setting, and outcomes within the study. However, when calculating the overall effect size, the multiple effect sizes were averaged to create a single effect size for each study. The shifting unit of analysis approach maximizes the amount of data from each study without violating the assumption of independent data points.

3.6.2 Across-study Synthesis

The synthesis of effect sizes across conceptually similar constructs were conducted in order to determine the magnitude of the effect when combining similar outcome effects from several studies. However, all cross study synthesis utilized only one comparison effect size per study for any summary synthesis so that no single study outcome is represented more than one time in any analysis. For any group study (e.g., RCT, QED), any Cohen's d effect sizes or means and standard deviations were converted to a log odds ratio effect size so that all effect sizes for all group studies will be presented in the same metric. The following conversion formula was used:

$$\text{LogOddsRatio} = d \frac{\pi}{\sqrt{3}},$$

The log odds ratio was synthesized in the final analysis (with results translated back into odd ratio for interpretability). We used a random-effects inverse variance weighting method to synthesize the effect sizes. Confidence intervals were calculated and reported as well.

The magnitude of the intervention effect was calculated using the commonly accepted statistical formulae and dedicated programs available.

3.6.3 Heterogeneity Analysis

For the analysis of dichotomous and continuous data, an assessment of heterogeneity was conducted using τ^2 (tested against the null hypothesis of $\tau^2 = 0$) and I^2 for ease of interpretability (see Higgins, Thompson, Deeks, & Altman, 2003). It is suggested that 50% is a moderate level of heterogeneity. We used a random effects model for heterogeneity analysis.

3.6.4 Sensitivity Analysis

A sensitivity analysis was conducted to assess the impact of a single study on the magnitude of an overall observed effect size. The sensitivity analysis was also to be conducted for the impact of moderating variables (e.g., attrition, type of treatment, missing data, sample size, study design). However, due to lack of data and reporting among the included studies, only study design was tested as a moderator.

3.6.5 Publication Bias

Publication bias was not assessed for published vs. unpublished included studies because there were no unpublished studies in this synthesis. However, we provide a funnel plot to assess the potential for small study bias (see Figure 4.1 and 4.2).

3.6.6 Incomplete Reporting of Study Data

For studies reporting incomplete outcome data ($k = 3$), we first contacted the senior author of the study and requested the missing information to include in the analysis. Study authors did not respond to our inquiries, so studies with incomplete data where imputation was not possible were excluded.

3.6.7 Subgroup and Moderator Analyses

Subgroup/moderator analyses were not conducted, except for study design (due to interest to a priori theoretical considerations). Since the approach to the moderator analyses were dependent on the available data, our included study sample did not allow us to conduct moderator or subgroup analyses given the small number of studies (<10) available within any category of moderator.

3.7 TREATMENT OF QUALITATIVE RESEARCH

Qualitative research was not included in the analysis of the intervention research. However, these studies were reviewed for potential background information and trends related to this review.

4 Results

4.1 INFORMATION RETRIEVAL

The combined electronic, hand searches, and examination of the grey literature produced a total of 20,249 citations at Stage 1 Abstract/Citation after removing any duplicate citations. All citations were saved in an Endnote® library.

Of these citations, 70 were advanced for collection of a full text copy of the study (Full-Text Stage 2) if either one of the two independent reviewers agreed it appeared to meet the inclusion criteria.

Upon review of the full-text for each of the 70 studies, 8 randomized controlled trials and 4 quasi-experimental studies met all inclusion criteria. A list of the 58 excluded studies and the reasons for exclusion are presented in Appendix C. Studies that did not describe or assess an intervention (n = 22), did not present outcomes related to gainful employment (n = 23), used solely a medical intervention (n = 6), did not provide a comparison/control group (n = 7), or did not have participants with a cancer diagnosis were excluded. See Figure 1 for a flow diagram of the information retrieval.

4.2 DESCRIPTION OF THE STUDIES

This section narratively summarizes the included studies and their characteristics such as research design, sample sizes, setting and recruitment, participants, interventions, and outcomes. Note that the studies will be referred by the last name of the first author and the year of the publication. See Table 9.1 entitled “Characteristics of included studies and assessment of risk of bias” for more details at the end of the report.

4.2.1 Research Design

Eight of the 12 included studies were randomized controlled trials (Berglund, 1994; Granstam-Bjorneklett, 2013; Hubbard, 2013; Lepore, 2003; Maguire, 1983; Maunsell, 1996; Purcell, 2011; Tamminga, 2013). The other four were quasi-experimental studies, (Bottcher, 2013; Capone, 1980; Gordon, 1980; Sachs, 1980) which compared the treatment groups to a non-equivalent yet comparable

comparison group. No discussion of matching procedures was included in the quasi-experimental study reports.

All experimental studies allocated conditions at the level of the individual participant. Two studies used a form of stratification in the randomization process. One study stratified by adjuvant chemotherapy (Granstam-Bjorneklett, 2013) and another by age and cancer type (Tamminga, 2013). No included studies used wait-listed control groups. Five included studies reported data at multiple follow-up points (Berglund, 1994; Capone, 1980; Granstam-Bjorneklett, 2013; Hubbard, 2013; Maunsell, 1996).

4.2.2 Sample Sizes

The number of unique participants from both treatment and comparison groups within the 12 included studies was 2151. The average sample size per study was 139.5 participants (Treatment: 65.7 participants; Comparison: 73.8 participants).

4.2.3 Setting and Recruitment

All included studies recruited their participants through a hospital or clinic. Recruitment often occurred through referrals after chemotherapy or surgery.

A hospital or clinic was typically the primary treatment setting. The few exceptions were studies that incorporated treatments at the hospital as well as the home such as phone interviews/consultations or home visitations (Lepore, 2003; Maunsell, 1996). Another study incorporated the home setting with a vocational rehabilitation agency (Hubbard, 2013). One study administered treatment at a resort (Granstam-Bjorneklett, 2013). One study did not specify the treatment setting in the research report (Purcell, 2011).

4.2.4 Participants

4.2.4.1 Cancer type and treatment history

All participants had a cancer diagnosis as per the inclusion criteria. Six studies included only participants with breast cancer (Granstam-Bjorneklett, 2013; Hubbard, 2013; Maguire, 1983; Maunsell, 1996; Sachs, 1980). Two other studies had samples with varying diagnoses, but mainly breast cancer (Berglund, 1994; Purcell, 2011; Tamminga, 2013). One study included only prostate cancer patients (Lepore, 2003), and another included only gynecological cancer patients (Capone, 1980). The remaining studies included participants with a variety of cancer diagnoses ranging from breast cancer, genital cancer, lymphoma, thyroid cancer, airways cancer, stomach cancer, melanoma, and lung cancer (Bottcher, 2013; Gordon, 1980). Almost all participants had surgery or other treatment in the included studies. One study included participants without any prior medical treatment (e.g. surgery, radiation) for their present condition (Gordon, 1980). One study did not report whether their participants were post-operative or post-treatment (Capone, 1980).

4.2.4.2 Age and ethnicity

All studies reported age of the participants except for two (Maguire, 1983; Sachs, 1980). As expected, the majority of studies had participants over the age of 50. The average age of participants for studies that specified age was 54.32 years. Ethnicity was only reported for a few studies (Capone, Gordon, Lepore, 2003; Purcell, 2011), which included participants who would be classified by the United States Census categories as “White.”

4.2.4.3 Education level and socioeconomic status

Few studies reported the education level or socioeconomic status of the participants. If they did so, they reported a relatively even distribution of educational levels and socioeconomic statuses among the participants.

4.2.5 Interventions

Interventions varied widely in program components and duration. Three of the included interventions consisted solely of an educational or training component on topics ranging from physical information such as cancer biology, how to control side effects, and future health concerns, coping and stress, and goal setting. (Berglund, 1994; Lepore, 2003; Purcell, 2011). One study incorporated follow-up phone calls to reinforce the information (Purcell, 2011). Other interventions consisted of a therapeutic or counseling component on issues related to emotional support, behavioral change, holistic self-concept, and information-processing (Capone, 1980; Maguire, 1983). Two interventions paired education and counseling interventions together (Gordon, 1980; Maunsell, 1996). Two interventions combined physical components with education or counseling-related components such as integrating informational sessions with relaxation, qi-gong, and “liberating dance” (Granstam-Bjorneklett, 2013) or combining information, exercise, discussion, and group therapy (Sachs, 1980). In a similar way, another study evaluated a case-management intervention that tailored individual plans to integrate both physical and counseling components (Hubbard, 2013). Only two interventions directly addressed return-to-work or job-related issues by establishing return-to-work plans for cancer survivors combined with informational sessions (Tamminga, 2013) or therapy on job-related issues with physical therapy (Bottcher, 2013). See Figure 2 for a checklist of intervention components across studies.

4.2.6 Outcomes

Employment status or return-to-work was the primary outcome of the review, assessed by 10 studies (Berglund, 1994; Bottcher, 2013; Capone, 1980; Gordon, 1980; Lepore, 2003; Maguire, 1983; Maunsell, 1996; Purcell, 2011; Sachs, 1980; Tamminga, 2013). Two of these studies also included the hours worked as a secondary outcome (Purcell, 2011; Maunsell, 1996). A related primary outcome was the amount of sick leave taken by the participants. Two studies only included sick

leave (Hubbard, 2013; Granstam-Bjorneklett, 2013), and two studies included sick leave as well as employment status (Berglund, 1994; Tamminga, 2013).

4.3 RISK OF BIAS

The potential risk of bias of included studies was assessed by evaluating the following: (1) selection bias, (2) performance bias, (3) detection bias, (4) attrition bias, and (5) reporting bias. See Figure 3 for a summary of the risk of bias assessment across studies.

4.3.1 Selection bias

The majority of randomized studies had relatively low risk of selection bias due to specifying a method of generating an allocation sequence including the use of a biased coin design (Berglund, 1994), envelope (Granstam-Bjorneklett, 2013; Lepore, 2003), Bernoulli probability distribution (Hubbard, 2013), random numbers table (Maguire, 1983), or random number generator (Purcell, 2011). Other randomized studies did not specify the generation of the allocation sequence (e.g., Maunsell, 1996). Other studies (e.g., Capone, 1983; Gordon, 1980) have high risk of selection bias due to lack of randomization.

4.3.2 Performance bias

Only one included study specified that the researcher was blinded to the allocation of subjects (Purcell, 2011). Many studies were judged to have unclear risk of performance bias due to lack of specification of researcher blinding.

4.3.3 Detection bias

Risk of detection bias was low for three studies that specified that assessors were blinded to participants' allocation (Hubbard, 2013; Lepore, 2003; Purcell, 2011). The remaining studies were judged to have unclear risk of detection bias.

4.3.4 Attrition bias

Attrition was generally well-reported (low risk of bias) in the included studies, which often explained attrition due to one or a combination of the following: cancer recurrence, misdiagnosis, decline, refusal to participate or death (Berglund, 1994; Gordon, 1980; Hubbard, 2013; Lepore, 2003; Maguire, 1983; Tamminga, 2013). Some studies acknowledged the presence of attrition in their studies but did not discuss reasons (Bottcher, 2013; Capone, 1983; Granstam-Bjorneklett, 2013). Lastly, two studies did not discuss any attrition (Purcell, 2011; Sachs, 1980), resulting in a rating of unclear risk of attrition bias.

4.3.5 Reporting bias

About half of the included studies had low risk of reporting bias and provided

adequate information to derive effect sizes. Some studies did not include data on all follow-up time points such as all outcome data (Berglund, 1994) and sample sizes (Bottcher, 2013; Capone, 1980; Gordon, 1980; Lepore, 2003; Maguire, 1983; Sachs, 1980).

4.4 EFFECTS OF INTERVENTIONS

4.4.1 Employment status

Ten studies (Berglund, 1994; Bottcher, 2013; Capone, 1980; Gordon, 1980; Lepore, 2003; Maguire, 1983; Maunsell, 1996; Purcell, 2011; Sachs, 1980; Tamminga, 2013) measured employment status (employed vs. unemployed). Two main measures were used: employment status or return-to-work. Since studies that measured employment status did not distinguish whether participants had prior employment before cancer diagnosis or treatment, we combined these measurements as a single measure of gainful employment status. The results of the studies were synthesized in a random-effects meta-analysis using the odds ratio effect sizes. The weighted mean effect size for employment status was $OR = 1.71$ (95% confidence interval (CI) = 1.26 to 2.32); $P = 0.001$, favoring the intervention groups. To better interpret the odds ratio, we converted the mean odds ratio to percentages. We first calculated a baseline employment rate for all the comparison groups across studies, which was 60%. The adjusted odds ratio of 1.71 translates to an employment rate of about 71% for intervention participants, a non-trivial change. See Table 2 for a summary of intervention effects and Table 3 for effects on employment status. See Figure 5.1 for a forest plot. We assessed heterogeneity using the Q-statistic ($Q(10) = 15.89$, $P = 0.10$), I^2 (37.06%), and τ^2 (0.09). These statistics collectively indicate that the distribution of effect sizes is relatively homogeneous. This homogeneity and the small number of included studies suggest that the examination of moderators is not warranted.

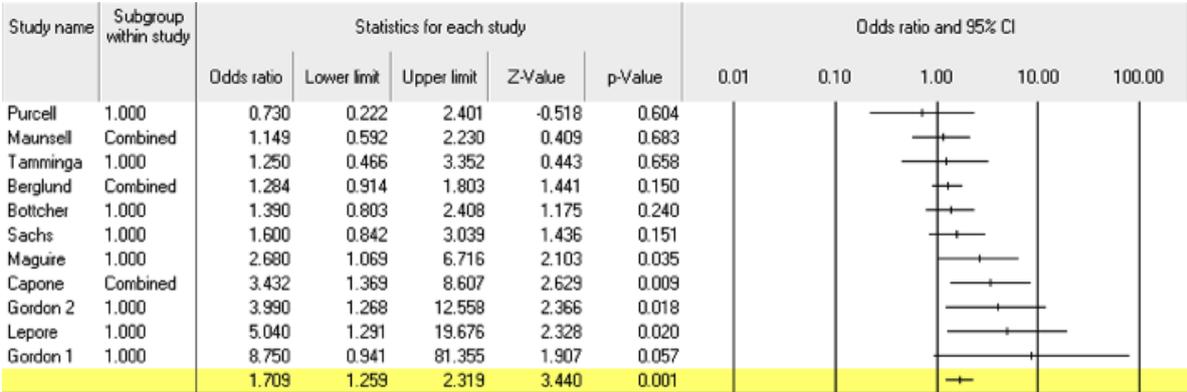


Figure 5.1. Forest Plot for Studies with Employment Outcome. Note. Gordon 1 refers to intervention for melanoma patients. Gordon 2 refers to intervention for breast cancer patients.

Although we did not locate a large enough number of eligible studies to conduct moderator analyses, we performed an exploratory analysis to distinguish effects of the randomized controlled trials from the quasi-experimental studies. For RCTs, the

weighted mean effect size for employment status was $OR = 1.44$ ($CI = 0.99$ to 2.09); $p = 0.058$. The mean odds ratio of 1.44 translates to an employment rate of about 68% for intervention participants, compared to the baseline 60% for comparison group participants described previously. For QEDs, the weighted mean effect size for employment status was $OR = 2.18$ ($CI = 1.32$ to 3.60); $p = 0.002$. The mean odds ratio of 2.18 for the quasi-experimental studies translates to an employment rate of about 77% for intervention participants, compared to the baseline rate of 60% for the comparison group participants. See Figure 5.2 for a forest plot. Although the mean effect size from QEDs was larger than that from the RCTs, there is no significant difference between the two types of experimental designs ($p = 0.19$).

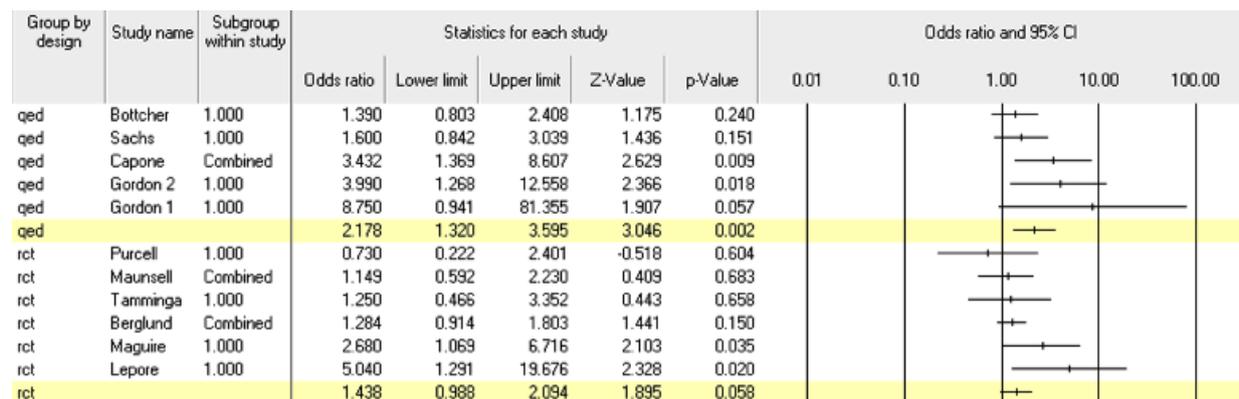


Figure 5.2. Forest Plot for Studies with Employment Outcome by Research Design (RCT and QED).

This result provides a potentially troubling indication that QED studies may be over-estimating intervention effects on employment whereas the RCT studies, when examined alone, result in a non-significant mean effect size. Therefore, caution needs to be exercised when interpreting the effectiveness of these interventions for increasing employment.

4.4.2 Hours worked

The number of hours worked was measured as an outcome in two studies (Maunsell, 1996; Purcell, 2011). Both studies were randomized controlled trials. The weighted mean effect size for hours worked was $OR = 0.89$ ($CI = 0.22$ to 1.52 ; $p = 0.67$), favoring the comparison groups. This non-significant result indicates there was no evidence of an effect of the interventions on working hours. See Table 4 for effects on number of hours worked.

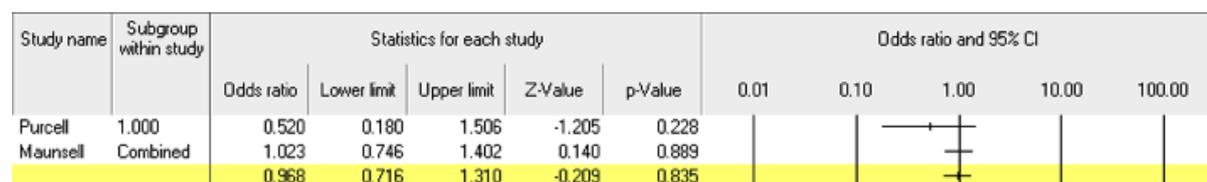


Figure 5.3. Forest Plot for Studies with Hours Worked Outcome

4.4.3 Sick Leave

Four studies (Berglund, 1994; Granstam-Bjorneklett, 2013; Hubbard, 2013; Tamminga, 2013) measured sick leave. All four studies were randomized controlled trials. Sick leave was measured as the average number of days taken by cancer survivors. The weighted mean effect size for sick leave was $OR = 1.18$ (CI = 0.81 to 1.71; $p = 0.39$), favoring intervention participants. This non-significant result indicates there was no evidence of an effect of the interventions on sick leave. See Table 5 for effects on sick leave.

Study name	Subgroup within study	Statistics for each study					Odds ratio and 95% CI				
		Odds ratio	Lower limit	Upper limit	Z-Value	p-Value	0.01	0.10	1.00	10.00	100.00
Granstam	Combined	0.941	0.688	1.286	-0.383	0.702					
Berglund	Combined	1.000	0.566	1.766	0.000	1.000					
Tamminga	2.000	1.590	0.834	3.032	1.408	0.159					
Hubbard	Combined	3.080	0.891	10.652	1.777	0.076					
		1.178	0.812	1.709	0.861	0.389					

Figure 5.4. Forest Plot for Studies with Sick Leave Outcome

5 Discussion

5.1 SUMMARY OF THE MAIN RESULTS

We found 12 studies evaluating the effects of psychosocially-related interventions for the employment of cancer survivors. Our results provide promising evidence that the included interventions may improve employment status ($OR = 1.71, p = 0.001$) for cancer survivors. For RCTs, the weighted mean effect size for employment status was $OR = 1.44$ ($CI = 0.99$ to 2.09), favoring the intervention groups. The mean odds ratio of 1.44 translates to an employment rate of about 68% for intervention participants compared to a baseline 60% for comparison group participants. For QEDs, the weighted mean effect size for employment status was $OR = 2.18$ ($CI = 1.32$ to 3.60), also favoring the intervention groups. The mean odds ratio of 2.18 for the quasi-experimental studies translates to an employment rate of about 77% for intervention participants, compared to the baseline rate of 60% for the comparison group participants. Although the mean effect size from QEDs was larger than that from the RCTs, there is no significant difference between the two types of experimental designs. There was no evidence of an effect on the number of hours worked ($OR = 0.89, p = .67$) or for number of sick leave days ($OR = 1.18, p = 0.39$).

5.2 OVERALL COMPLETENESS AND APPLICABILITY OF EVIDENCE

The number of included studies was small given our inclusion criteria, producing a much larger pool of studies that were excluded. Moreover, the wide range of the types of interventions that were included most likely decreases the precision of the results of this review. Lastly, the included studies demonstrated a narrow age range, in particular, older age participants. The nature of our population, cancer survivors, tends to be older due to the late timing of when cancer occurs. Nine of the 10 studies that reported participant age had individuals of an average age of over 50 years. Additional research on these particular interventions and younger participants is needed before more specific generalizations and recommendations for the effectiveness of these programs can be put forth.

5.3 QUALITY OF THE EVIDENCE

This systematic review found limited evidence of sufficient methodological rigor confidently assess the effects of interventions for employment of cancer survivors. Overall, the number of RCTs was few in number, and even with quasi-experimental studies, sample sizes were relatively small (ranging from treatment groups of 7 to 172 participants). Moreover, the majority of studies lacked information about the study elements needed to assess risk of bias or evidenced high risk of bias. One particular study characteristic that was consistently missing from study reports was an assessment of treatment fidelity, a useful aspect for interpreting particularly conspicuous findings and to aid in broadening generalizability. Although some studies report dosage of the intervention and contamination of the control group (e.g., Tamminga, 2013), discussion of whether the intervention was implemented as intended was lacking. Overall, the internal and external validity of the included studies were limited.

5.4 POTENTIAL BIASES IN THE REVIEW PROCESS

The greatest bias in our review arises from interpretation of the intervention programs due to the multi-dimensional nature of our included studies. Although we limited our criteria to interventions that were psychosocial in nature, the broad range of interventions was unexpected and may be a source of additional weakness in interpreting the findings. The nature of many interventions targeted at cancer survivors tend to be multidisciplinary in nature, incorporating aspects from psychiatry, education, and physical exercise/medicine. This type of multi-component interventions obfuscates a clear “what works” picture for particular facets of a program, but at the same time, may be a potentially effective approach in facilitating employment for cancer survivors.

5.5 AGREEMENTS AND DISAGREEMENTS WITH OTHER STUDIES OR REVIEWS

This review presents the first meta-analysis of psychosocial interventions for improving employment for cancer survivors. Previous reviews (e.g., de Boer et al. 2011) did not average effects of interventions, omitted particular studies that measured employment-related outcomes, or were premature, precluding the development of more recent evaluations of interventions. De Boer et al. (2011) found relatively large effects for psychological interventions but did not locate any studies of vocational interventions in the field. Our review includes vocationally-oriented interventions and finds more modest support for the overall impact of psychosocial interventions for improving employment status among cancer survivors. In addition, our review includes other employment-related outcomes such as number of hours worked and sick leave.

The authors will examine the review every three years after publication for update as per C2 policy.

6 Conclusion

6.1 IMPLICATIONS FOR PRACTICE

This review highlights the positive effect psychosocial interventions may have on employment outcomes for cancer survivors. The multi-dimensional nature of the included interventions makes it difficult to isolate effective individual components. However, results suggest that multi-component interventions that incorporate information or educational training, counseling or coping skills sessions, and also physical exercise components may be the best way to target the generally multi-dimensional nature of employment for cancer survivors. In addition, some methodological shortcomings of the studies overall make it likely that there is bias in the results and too few studies to provide sufficiently strong evidence to recommend particular practices.

6.2 IMPLICATIONS FOR RESEARCH

This review highlights the need for additional rigorous studies in this area, in particular, randomized controlled trials with more detailed reporting of data and components of study design. Studies also need to report the fidelity with which the program was implemented and describe in more detail an intervention's particular features and duration. New trials need to collect information on employment status and not solely self-reported measures of quality of life. Many otherwise rigorous studies were excluded for this reason. Simple additions to interview protocols or questionnaires can provide valuable insight on whether interventions affect employment outcomes. In addition, perhaps more interventions that focus specifically on VR such as on-the-job supports, interview-training, strategies to cope with symptoms while working are needed to assess whether these programs influence return-to-work and employment (e.g., Tamminga et al., 2013).

7 Acknowledgements

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8 References

*Denotes included studies

- American Cancer Society. (2011). *Cancer facts & figures 2011*. Atlanta: American Cancer Society. Retrieved from <http://www.cancer.org/acs/groups/content/@epidemiologysurveillance/documents/document/acspc-029771.pdf>
- American Cancer Society. (2012). *Cancer treatment and survivorship facts & figures 2012-2013*. Atlanta: American Cancer Society. Retrieved from <http://www.cancer.org/acs/groups/content/@epidemiologysurveillance/documents/document/acspc-033876.pdf>
- American Cancer Society. (2014). *When someone you work with has cancer*. Atlanta: American Cancer Society. Retrieved from <http://www.cancer.org/acs/groups/cid/documents/webcontent/002945-pdf.pdf>
- Arnold, K. (1999). Americans With Disabilities Act: Do cancer patients qualify as disabled? *Journal of the National Cancer Institute*, 91(10), 822-825.
- *Berglund, G., Bolund, C., Gustafsson, U.-L., & Sjoden, P. O. (1994). One-Year follow-up of the 'Starting Again' group rehabilitation programme for cancer patients. *European Journal of Cancer*, 30a(12), 1744-1751.
- Blinder, V. S., Patil, S., Thind, T., Diamant, A., Hudis, C. A., Basch, E. & Maly, R. C. (2011). Return to work in low-income Latina and non-Latina white breast cancer survivors: A 3-year longitudinal study. *Cancer*, 118(6), pp. 1664-1674. doi: 10.1002/cncr.26478
- Borenstein, M., Hedges, L., Higgins, J., & Rothstein, H. (2005). *Comprehensive meta-analysis* (Version 2.1) [Computer software]. Englewood, NJ: BioStat.
- *Bottcher, H. M., Steimann, M., Ullrich, A., Rotsch, M., Zurborn, K.-H., Koch, U. & Bergelt, C. (2013). [Evaluation of a vocationally oriented concept within inpatient oncological rehabilitation]. German. *Rehabilitation*, 52, 329-335.
- Bureau of Labor Statistics. (2008). *BLS Information – Glossary*. Washington, DC: U.S. Department of Labor Statistics. Retrieved from <http://www.bls.gov/bls/glossary.htm#W>
- *Capone, M. A., Good, R. S., Westie, K. S., & Jacobsen, A. F. (1980). Psychosocial rehabilitation of gynecologic oncology patients. *Arch Phys Med Rehabil*, 61, 128-132.
- Centers for Disease Control (2011). *Cancer Survivorship Today*. Retrieved from <http://www.cdc.gov/cancer/survivorship/>

- Chiu, C., Chan, F., Strauser, D., Feuerstein, M., Ditchman, N., Cardoso, E., ... Muller, V. (2013). State rehabilitation services tailored to employment status among cancer survivors. *Journal of Occupational Rehabilitation, Online First* (16 March, 2013). doi: 10.1007/s10926-013-9434-0.
- Cooper, H. (1998). *Synthesizing research: A guide for literature reviews*. (3rd Ed.). Thousand Oaks, CA: Sage.
- de Boer, A. G. E.M, Taskila, T., Ojajärvi A., van Dijk, F. J., & Verbeek, J. H. (2009). Cancer survivors and unemployment: A meta-analysis and meta-regression. *Journal of the American Medical Association, 301*(7), 753-762.
- de Boer, A. G. E. M., Taskila, T., Tamminga, S. J., Frings-Dresen, M. H. W., Feuerstein, M., & Verbeek, J. H. (2011). Interventions to enhance return-to-work for cancer patients. *Cochrane Database Of Systematic Reviews, 16*(2), 2CD007569.
- Fleishman, S. B., Retkin, R., Brandfield, J., & Braun, V. (2006). The attorney as the newest member of the cancer treatment team. *Journal of Clinical Oncology, 24*(13), p. 2123-2126. doi: 10.1200/JCO.2006.04.2788.
- Feuerstein, M., Luff, G. M., Harrington, C. B., & Olsen, C.H. (2007). Pattern of workplace disputes in cancer survivors: A population study of ADA claims. *Journal of Cancer Survivorship, 1*(3), 185-192. doi: 10.1007/s11764-007-0027-9
- Fong, C. J., Murphy, K. M., Westbrook, J. D., & Markle, M. (2013). Behavioral, psychological, and vocational interventions to facilitate employment for cancer survivors. Protocol for *Campbell Systematic Reviews*. <http://www.campbellcollaboration.org/lib/project/225/>
- Garrett, J. (2012, October). Recovery at work: treatment may end, but challenges persist for breast cancer survivors. *Madison Magazine*. Available online at <http://www.madisonmagazine.com/Madison-Magazine/October-2012/Recovery-at-Work/>
- Gensby, U., Lund, T., Kowlalski, K., Saidj, M., Jørgensen, A. K., ... Labriola, M. (2012). Workplace disability management programs promoting a return-to-work: A systematic review. *Campbell Systematic Reviews, 17*. DOI: 10.4073/csr.1012.17
- *Gordon, W. A., Freidenbergs, I., Diller, L., Hibbard, M., Wolf, C., Levine, L., Lipkins, R., Ezrachi, O., & Lucido, D. (1980). Efficacy of psychosocial intervention with cancer patients. *Journal of Consulting and Clinical Psychology, 48*(6), 743-759.
- *Granstam Bjorneklett, H., Rosenblad, A., Lindemalm, C., Ojutkangas, M-L., Letocha, H., Strang, P., & Bergkvist, L. (2013). A randomized controlled trial of support group intervention after breast cancer treatment: Results on sick leave, health care utilization and health economy. *Acta Oncologica, 52*, 38-47.
- Hewitt M. F., Greenfield S., & Stovall E. (Eds.). (2006). *From cancer patient to cancer survivor: Lost in transition*. Washington, DC: The National Academies Press.

- Higgins, J., & Green, S. (Eds.). (2011). *Cochrane handbook for systematic reviews of interventions. Version 5.1.0*. The Cochrane Collaboration. Retrieved from <http://handbook.cochrane.org>
- Higgins, J., Thompson, S.G., Deeks, J. J., & Altman, D. G. (2003). Measuring inconsistency in meta-analyses. *The BMJ*, *327*(7414), 557-560.
- Hoffman, B. (2012). *Working it out: Your employment rights as a cancer survivor*. National Coalition for Cancer Survivorship. Retrieved from http://www.canceradvocacy.org/wp-content/uploads/2013/01/Working_It_Out.pdf
- Howlander N, Noone AM, Krapcho M, Neyman N, Aminou R, Waldron W, Altekruse SF, Kosary CL, Ruhl J, Tatalovich Z, Cho H, Mariotto A, Eisner MP, Lewis DR, Chen HS, Feuer EJ, Cronin KA, Edwards BK (eds). SEER Cancer Statistics Review, 1975-2008, National Cancer Institute. Bethesda, MD, http://seer.cancer.gov/csr/1975_2008/, based on November 2010 SEER data submission, posted to the SEER web site, 2011.
- *Hubbard, G., Gray, N. M., Ayansina, D., Evans, J. M. M., & Kyle, R. G. (2013). Case management vocational rehabilitation for women with breast cancer after surgery: A feasibility study incorporating a pilot randomized controlled trial. *Trials*, *14*(175).
- Kyle, R. G., Culbard, B., Evans, J., Gray, N. M., Ayansina, D., & Hubbard, G. (2011). Vocational rehabilitation services for patients with cancer: Design of a feasibility study incorporating a pilot randomised controlled trial among women with breast cancer following surgery. *Trials*, *12*, 89.
- Ladehoff, N., Sturm, K., & Mehnert, A. (2013). Work-related self-report measures and assessment tools in cancer survivorship: A systematic literature review. *Disability and Rehabilitation*, *35*(2), 100-112. doi: 10.3109/09638288.2012.688921
- *Lepore, S. J., Helgeson, V. S., Eton, D. T., & Schulz, R. (2003). Improving quality of life in men with prostate cancer: A randomized controlled trial of group education interventions. *Health Psychology*, *22*(5), 443.
- *Maguire, P., Brooke, M., Tait, A., Thomas, C., & Sellwood, R. (1983). The effect of counselling on physical disability and social recovery after mastectomy. *Clinical Oncology*, *9*, 319-324.
- *Maunsell, E., Brisson, J., Deschenes, L., & Frasire-Smith, N. (1996). Randomized trial of a psychologic distress screening program after breast cancer: Effects on quality of life. *Journal of Clinical Oncology*, *14*(10), 2747-2755.
- Mehnert, A. (2011). Employment and work-related issues in cancer survivors. *Critical Reviews in Oncology/Hematology*, *77*(2), 109-130. doi: 10.1016/j.crirevonc.2010.01.004.
- Mehnert, A., de Boer, A., & Feuerstein, M. (2013). Employment challenges for cancer survivors. *Cancer*, *119*, 2151-2159. Suppl 11:2151-9. doi: 10.1002/cncr.28067.

- Meyer, T. J., & Mark, M. M. (1995). Effects of psychosocial interventions with adult cancer patients: a meta-analysis of randomized experiments. *Health Psychology, 14*(2), 101.
- Münstedt, K., Manthey, N., Sachsse, S., & Vahrson, H. (1997). Changes in self-concept and body image during alopecia induced cancer chemotherapy. *Supportive Care in Cancer, 5*(2), 139-143.
- Murphy, K. M., Markle, M. M., Nguyen, V., & Wilkinson, W. (2013). Addressing the employment-related needs of cancer survivors. *Work: A Journal of Prevention, Assessment and Rehabilitation, 46*(4), 423-432.
- Nathan, P. C., Hayes-Lattin, B., Sisler, J. J., & Hudson, M. M. (2011). Critical issues in transition and survivorship for adolescents and young adults with cancers. *Cancer, 117*(10), 2335-2341.
- National Rehabilitation Information Center. (2012). *NIDRR Program Directory*. Retrieved from <http://search.naric.com/research/pd/pdf/NIDRR2012.pdf>
- Nieuwenhuijsen, K., Bos-Ransdorp, B., Uitterhoeve, L. L. J., Sprangers, M. A., & Verbeek, J. H. (2006). Enhanced provider communication and patient education regarding return to work in cancer survivors following curative treatment: A pilot study. *Journal of Occupational Rehabilitation, 16*, p. 647-657. doi: 10.1007/s10926-006-9057-9.
- *Purcell, A., Fleming, J., Burmeister, B., Bennett, S., & Haines, T. (2011). Is education an effective management strategy for reducing cancer-related fatigue? *Support Care Cancer, 19*, 1429-1439.
- Retkin, R., Antoniadis, D., Pepitone, D. F., Duval, D., (2013). Legal services: A necessary component of patient navigation. *Seminars in Oncology Nursing, 29*(2), 149-155.
- *Sachs, S. H., Davis, J. M., Reynolds, S. A., Spagnola, M., Hall, P., & Bloch, A. (1980). Postmastectomy rehabilitation in a community hospital. *Journal of Family Practice, 11*(3), 395-401.
- Staat, K., & Segatore, M. (2005). The phenomenon of chemo brain. *Clinical Journal of Oncology Nursing, 9*(6), 713-721.
- Strauser, D., Feuerstein, M., Chan, F., Arango, J., da Silva Cardoso, E., & Chiu, C. (2010). Vocational services associated with competitive employment in 18-25 year old cancer survivors. *Journal of Cancer Survivorship: Research And Practice, 4*(2), 179-186.
- Tamminga, S. J., de Boer, A. G. E. M., Verbeek, J. H. A. M., & Frings-Dresen, M. H. W. (2010). Return-to-work interventions integrated into cancer care: A systematic review. *Occupational and Environmental Medicine, 67*, 639-648.
- *Tamminga, S. J., Verbeek, J. H. A. M., Bos, M. M. E. M., Fons, G., Kitzen, J. J. E. M., Plaisier, P. W., Frings-Dresen, M. H. W., & de Boer, A. G. E. M. (2013). Effectiveness of a hospital-based work support intervention for female cancer patients: A multi-centre randomised controlled trial. *PLOS One, 8*(5), 9.
- Vonk Noordegraaf, A., Huirne, J. A. F., Brölmann, H. A. M., Emanuel, M. H., van Kesteren, P. J. M., Kleiverda, G., ... Anema, J. R. (2012). Effectiveness of a multidisciplinary care program on recovery and return to work of patients

after gynaecological surgery; design of a randomized controlled trial. *BMC Health Services Research*, 12, 29.

Waddell, G., Burton, A. K., & Kendall, N. A. S. (2008). *Vocational rehabilitation: What works, for whom, and when?* London: TSO.

Whatley, P. & Milne, R. (1998). *Psycho-social interventions in oncology: Counselling services for women with breast cancer. Development and Evaluation Committee Report; 86*. Southampton: Wessex Institute for Health Research and Development. Retrieved from <http://www.crd.york.ac.uk/CRDWeb/ShowRecord.asp?ID=11998009741#.UmmbEb8fmlI>

9 Characteristics of Included Studies and Assessment of Risk of Bias Table 9.1:

Study	Randomly allocated	Valid sample size used in data synthesis
Dennis et al., 2004	300	300 (MET/CBT5: 100, MDFT: 100, ACRA: 100)
Godley et al., 2010	320	320 (MET/CBT7: 79, MET/CBT7+ACC: 81, CBOP: 80, CBOP+ACC: 80)
Hendriks et al., 2011	109	109 (CBT: 54, MDFT: 55)
Kaminer et al., 1998a & 1999	32	23 (CBT: 13, IT: 10)
Kaminer et al., 2002	88	88 (CBT: 51, PET: 37)
Latimer et al., 2003	43	42 (IFCBT: 21, DHPE: 21)
Waldron et al., 2011	61	61 (MET/CBT: 31, FFT: 30)
Total N	953	853

9.1 BERGLUND (1994)

Characteristics of Study

Method	Randomized controlled trial
Setting	Hospital/clinic
Participant	T: 90 participants (mostly female); age 52-53 C: 98 participants (mostly female); age 52-53 Cancer: 80% breast, 7-8% ovarian, 12-13% other
Intervention	Description: Physical, information and coping skills group training delivered by an oncology nurse, accompanied by a specialist of the theme dealt with at each session. Session: 11 2-hour sessions
Outcome	Work status; sick leave
Notes	

Risk of Bias

Bias	Authors' Judgment	Description
Selection bias	Low	Efron's method (biased coin design) of randomization of small samples was used. Group sizes were forced towards equality by proportionately increasing the probability of assignment to smaller group. The oncological nurse assigned allocation of randomization.
Performance bias	Unclear	No discussion of researcher blinding in report.
Detection bias	Unclear	No discussion of assessor blinding in report
Attrition bias	Low	Attrition occurred between follow-up measures; grouped and identified attriters either due to death or recurrence of cancer.
Reporting bias	High	Reporting complete for work status in all three follow-up points; reporting incomplete for sick leave for all three follow-up points
Other bias	High	One third of the control group received a single information session on diet

9.2 BOTTCHEER (2013)

Characteristics of Study

Method	Quasi-experimental design, non-equivalent
Setting	Hospital/clinic
Participants	T: 172 participants (78.5% female); age 50.3 C: 93 participants (74.5% female); age 49 Cancer: 40.7% breast, 26.7% stomach, 12.2% genital, 4.7% lymphoma, 3.5% thyroid, 2.3% airways, 9.9% other
Interventions	Description: Group therapy focused on job-related issues accompanied with physiotherapy exercises for the workplace; rehabilitation counseling and social work support. Session: Not reported
Outcomes	Return-to-work
Notes	

Risk of Bias

Bias	Authors' Judgment	Description
Selection bias	High	No randomization, control group consisted of comparable patients that met similar criteria to treatment group
Performance bias	Unclear	No discussion of researcher blinding in report
Detection bias	Unclear	No discussion of assessor blinding in report
Attrition bias	High	Attrition occurred between follow-up measures; no discussion of

		attrition
Reporting bias	High	Poor reporting of sample sizes at follow-up
Other bias		

CAPONE (1980)

Characteristics of Study

Method	Quasi-experimental design, nonequivalent
Setting	Hospital/clinic
Participant	T: 85 participants (100% female); age 20-80 C: 40 participants (100% female); age 20-80 Cancer: 100% gynecological
Intervention	Description: Individual counseling with a psychologist to emotionally support reality-based expectations, behavioral change, holistic self-concept and information processing with a focus on early return to normal functioning Session: 4 sessions; length varied per patient need
Outcome	Work status
Notes	

Risk of Bias

Bias	Author's Judgment	Description
Selection bias	High	No randomization, control group consisted of comparable patients that met similar criteria to treatment group
Performance bias	Unclear	No discussion of researcher blinding in report
Detection bias	Unclear	No discussion of assessor blinding in report
Attrition bias	High	Attrition as well as additions occurred between follow-up measures; no discussion of attrition
Reporting bias	High	Poor reporting of sample sizes between follow-up; percentages
Other bias		

9.3 GORDON (1980)

Characteristics of Study

Method	Quasi-experimental, non-equivalent
Setting	Hospital/clinic
Participants	T: 59 participants (62.8% female); age 46.4 (melanoma), 59.4 (breast) C: 47 participants (73.1% female); age 49.86 (melanoma), 55.94 (breast) Cancer: 67% melanoma, 33% breast
Interventions	Description: Education, counseling, and "environmental manipulation" (consultations with other healthcare personnel, and/or formal service referrals.) Delivered by one oncology counselor per individual Session: 11 20-minute sessions
Outcomes	Job Maintenance
Notes	

Risk of Bias

Bias	Authors' Judgment	Description
Selection bias	High	No randomization, control group consisted of comparable patients that met similar criteria to treatment group
Performance bias	Unclear	No discussion of researcher blinding in report
Detection bias	Unclear	No discussion of assessor blinding in report
Attrition bias	Low	Attrition occurred through benign diagnosis, refusal to participate, and death
Reporting bias	High	Reported data by type of cancer and not by whole group, with poor reported of sample sizes
Other bias		

GRANSTAM-BJORNEKLETT (2013)

Characteristics of Study

Method	Randomized controlled trial (stratified)
Setting	Hospital/clinic
Participant	T: 191 participants (100% female); age 57.8 C: 191 participants (100% female); age 58.7 Cancer: 100% Breast
Intervention	Description: Information-based support program supplemented with relaxation, qi-gong, and “liberating dance” during a 7-day stay at a resort, followed by a 4-day follow-up two months later. Session: Session length not reported; length was approximately one resort stay of 7 days and one later of 4 days
Outcome	Sick leave
Notes	

Risk of Bias

Bias	Author's Judgment	Description
Selection bias	Low	Stratified randomization by envelope
Performance bias	Unclear	No discussion of researcher blinding in report
Detection bias	Unclear	No discussion of assessor blinding in report
Attrition bias	High	Attrition after randomization, not 100% response rate at follow-up
Reporting bias	Low	All necessary data were reported.
Other bias		

HUBBARD (2013)

Characteristics of Study

Method	Randomized controlled trial
Setting	Hospital/clinic
Participants	T: 7 participants (100% female); age 49.7 C: 11 participants (100% female); age 51 Cancer: 100% breast
Interventions	Description: Case management tailored to reported individual needs: Case manager conducted a needs assessment of supportive care needs within 10 days of enrollment. Subjects referred to different services tailored to their reported needs. Services included physiotherapy, occupational therapy, occupational health nurse, counsellor/psychological therapy and complementary therapy. Session: 6.2 sessions; length not reported
Outcomes	Sick leave
Notes	

Risk of Bias

Bias	Author's Judgment	Description
Selection bias	Low	Randomization by a Bernoulli probability distribution for random number generation
Performance bias	Unclear	No discussion of researcher blinding in report
Detection bias	Low	Researchers involved in data collection or outcome assessment did not know participant group allocation.
Attrition bias	Low	Attrition due to lack of data; does not seem to be systematic
Reporting bias	Low	All necessary data were reported.
Other bias		Changes to eligibility criteria to prevent the RCT from failing.

LEPORE (2003)

Characteristics of Study

Method	Randomized controlled trial (stratified)
Setting	Hospital/clinic
Participants	T1: 43 participants (0% female); age 64.8 T2: 42 participants (0% female); age 64.8 C: 40 participants (0% female); age 64.8 Cancer: 100% prostate
Interventions	Description: Lectures delivered by an expert on prostate cancer biology, control of physical side effects, nutrition, stress and coping, relationships and sexuality, follow-up care and future health concerns. Distribution of printed material and accompaniment with discussion in treatment group 2. Session: 6 1-hour sessions
Outcomes	Employment status
Notes	Employment status for those already working

Risk of Bias

Bias	Author's Judgment	Description
Selection bias	Low	Randomization by sealed envelope
Performance bias	Unclear	No discussion of researcher blinding in report
Detection bias	Low	Researchers involved in data collection or outcome assessment did not know participant group allocation.
Attrition bias	Low	Attrition due to major illness, death, time constraints, lost of interest, could not be located, and unexplained dropouts; unrelated to experimental conditions
Reporting bias	High	Poor reporting of sample sizes at follow-up for each condition
Other bias		

MAGUIRE (1983)

Characteristics of Study

Method	Randomized controlled trial
Setting	Hospital/clinic
Participants	T: 77 participants (100% female); age not reported C: 75 participants (100% female); age not reported Cancer: 100% breast
Interventions	Description: One-on-one nurse psychological counseling on feelings about scar and breast prosthesis, incorporating physical exercise and check-up suggesting disclosure with others. Encouragement of return-to-work with social activity. Session: 2 or more sessions; length not reported
Outcomes	Employment status
Notes	

Risk of Bias

Bias	Author's Judgment	Description
Selection bias	Low	Randomization using a random numbers table.
Performance bias	Unclear	No discussion of researcher blinding in report
Detection bias	Unclear	No discussion of assessor blinding in report
Attrition bias	High	Attrition due to refusal to continue, illness, or relocation.
Reporting bias	High	Poor reporting of sample sizes at follow-up
Other bias		

MAUNSELL (1996)

Characteristics of Study

Method	Randomized controlled trial
Setting	Not reported; intervention by phone
Participants	T: 123 participants (100% female); age 54.6 C: 127 participants (100% female); age 56.3 Cancer: 100% breast
Interventions	Description: Monthly screening to identify patients with high levels of psychological distress. Those who screen as highly stressed got individually tailored psychosocial follow-up of information/education, support/counseling, and referral if necessary. Session: 12 sessions; length not reported
Outcomes	Employment status
Notes	

Risk of Bias

Bias	Author's Judgment	Description
Selection bias	Unclear	Randomization; no technique discussed
Performance bias	Unclear	No discussion of researcher blinding in report
Detection bias	Unclear	No discussion of assessor blinding in report
Attrition bias	Low	Attrition due to incomplete data, misdiagnosis, and metastatic disease subsequent to randomization
Reporting bias	Low	All necessary data were reported.
Other bias		

PURCELL (2011)

Characteristics of Study

Method	Randomized controlled trial
Setting	Hospital/clinic
Participants	T: 27 participants (51.9% female); age 60.7 C: 26 participants (39.3% female); age 56.9 Cancer: Mixed, mainly breast and prostate
Interventions	Description: Educational program developed and delivered by multidisciplinary team for the purposes of this study involving a presentation to participants along with a handbook, goal-setting sheet and progress diary. Two follow-up phone calls using structured script 2 and 4 weeks after each education session to reinforce information. Control group received information about radiotherapy from a nurse, standard written information, and a 1-page flyer with "generic information about fatigue." Session: 4 1-hour sessions
Outcomes	Employment status, hours worked
Notes	

Risk of Bias

Bias	Author's Judgment	Description
Selection bias	Low	Randomization using a simple sequence developed using a computerized random number generator
Performance bias	Low	Researcher was blinded to group allocation.
Detection bias	Low	Assessor was blinded to group allocation.
Attrition bias	Unclear	No discussion of attrition
Reporting bias	Low	All necessary data were reported.
Other bias		

SACHS (1980)

Characteristics of Study

Method	Quasi-experimental, non-equivalent
Setting	Hospital/clinic
Participants	T: 86 participants (100% female); age not reported C: 84 participants (100% female); age not reported Cancer: Breast
Interventions	Description: Structured exercise, information, discussion and group therapy sessions conducted by a social worker, nurse, physical therapist and volunteer. Session: 90-minute sessions; session number varied per patient stay
Outcomes	Return-to-work
Notes	

Risk of Bias

Bias	Author's Judgment	Description
Selection bias	High	No randomization, control group consisted of comparable patients that met similar criteria to treatment group
Performance bias	Unclear	No discussion of researcher blinding in report
Detection bias	Unclear	No discussion of assessor blinding in report
Attrition bias	Unclear	No discussion of attrition
Reporting bias	High	Poor reporting of sample sizes at follow-up
Other bias		

TAMMINGA (2013)

Characteristics of Study

Method	Randomized controlled trial (stratified)
Setting	Hospital/clinic
Participants	T: 65 participants (100% female); age 47.5 C: 68 participants (100% female); age 47.6 Cancer: Mixed (Breast, Cervix, Ovarian, Vulva, Other)
Interventions	Description: Patient education/support at the hospital, delivered by a nurse or social worker. Improved communication between oncologist and occupational physician. Return-to-work plans drawn up by patient and employer in meeting organized by occupation physician. Session: 4 15-minute sessions
Outcomes	Employment status, sick leave
Notes	

Risk of Bias

Bias	Author's Judgment	Description
Selection bias	Low	Randomization using stratification of age and hospital department. Minimisation was applied to equalize sample sizes
Performance bias	Unclear	No discussion of researcher blinding in report
Detection bias	Unclear	No discussion of assessor blinding in report
Attrition bias	Low	Attrition due to cancer recurrence, decline, death or unknown reasons
Reporting bias	Low	All necessary data were reported.
Other bias		

10 Data and Analyses

TABLE 1: INTERVENTION VERSUS CONTROL/COMPARISON SUMMARY

Outcome	Studies/Samples	Participants	Effect Estimate
Employment Status	10/11	1194	OR = 1.71; CI = 1.26 to 2.32; P = 0.001
Hours Worked	2/2	295	OR = 0.89; CI = 0.22 to 1.52; P = 0.67
Sick Leave	4/4	574	OR = 1.18; CI = 0.81 to 1.71; P = 0.39

TABLE 2: EMPLOYMENT STATUS EFFECTS FROM INDIVIDUAL STUDIES

Study	Design	Participants	Effect Estimate	With Study Removed
Berglund 1994	RCT	198	OR = 1.28; CI = 0.91, 1.80	OR = 1.86; CI = 1.30, 2.56
Bottcher 2013	QED	265	OR = 1.39; CI = 0.80, 2.41	OR = 1.81; CI = 1.27, 2.59
Capone 1980	QED	125	OR = 3.43; CI = 1.37, 8.61	OR = 1.58; CI = 1.18, 2.13
Gordon 1980 (breast)	QED	106	OR = 8.75; CI = 0.94, 81.36	OR = 1.60; CI = 1.19, 3.13
Gordon 1980 (melanoma)	QED	106	OR = 3.99; CI = 1.27, 12.56	OR = 1.64; CI = 1.23, 2.20
Lepore 2003	RCT	125	OR = 5.04; CI = 1.29, 19.68	OR = 1.60; CI = 1.20, 2.14
Maguire 1983	RCT	153	OR = 2.68; CI = 1.07, 6.72	OR = 1.64; CI = 1.20, 2.26
Maunsell 1996	RCT	250	OR = 1.15; CI = 0.59, 2.23	OR = 1.82; CI = 1.30, 2.67
Purcell 2011	RCT	53	OR = 0.73; CI = 0.22, 2.40	OR = 1.79; CI = 1.31, 2.43

Sachs 1980	QED	170	<i>OR</i> = 1.60; <i>CI</i> = 0.84, 3.04	<i>OR</i> = 1.76; <i>CI</i> = 1.24, 2.50
Tamminga 2013	RCT	133	<i>OR</i> = 1.25; <i>CI</i> = 0.47, 3.35	<i>OR</i> = 1.77; <i>CI</i> = 1.27, 2.47

TABLE 3: SICK LEAVE EFFECTS FROM INDIVIDUAL STUDIES

Study	Design	Participants	Effect Estimate	With Study Removed
Berglund 1994	RCT	198	OR = 1.00; CI = 0.57, 1.77	OR = 1.12; CI = 0.81, 1.54
Granstasm- Bjorneklett 2013	RCT	382	OR = 0.94; CI = 0.69, 1.29	OR = 1.13; CI = 0.83, 1.55
Hubbard 2013	RCT	18	OR = 3.08; CI = 0.89, 10.65	OR = 1.03; CI = 0.80, 1.33
Tamminga 2013	RCT	133	OR = 1.59; CI = 0.83, 3.032	OR = 1.01; CI = 0.77, 1.32

TABLE 4: HOURS WORKED EFFECTS FROM INDIVIDUAL STUDIES

Study	Design	Participants	Effect Estimate	With Study Removed
Maunsell 1996	RCT	250	OR = 1.02; CI = 0.75, 1.40	OR = 0.52; CI = 0.18, 1.51
Purcell 2011	RCT	53	OR = 0.52; CI = 0.18, 1.51	OR = 1.02; CI = 0.75, 1.40

11 Figures

FIGURE 1: FLOW OF INFORMATION RETRIEVAL

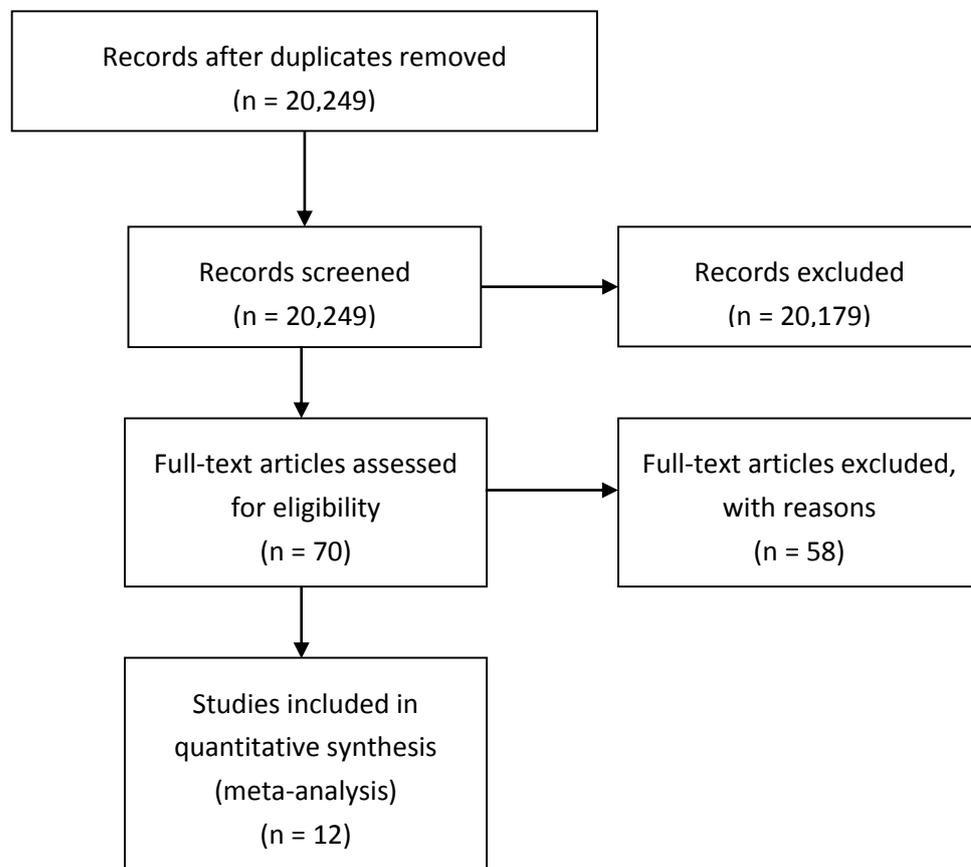


FIGURE 2: PROGRAM FEATURE CHECKLIST OF INTERVENTIONS

	Educational Sessions	Skills Training	Phone Support	Physical/Exercise	Individual Counseling	Group Counseling/ Discussion	Vocational/job- related training
Berglund 1994	<input type="checkbox"/>	<input type="checkbox"/>					
Bottcher 2013				<input type="checkbox"/>		<input type="checkbox"/>	<input type="checkbox"/>
Capone 1980					<input type="checkbox"/>		
Gordon 1980	<input type="checkbox"/>				<input type="checkbox"/>		
Granstam-Bjorneklett 2013	<input type="checkbox"/>			<input type="checkbox"/>			
Hubbard 2013				<input type="checkbox"/>	<input type="checkbox"/>		
Lepore 2003	<input type="checkbox"/>					<input type="checkbox"/>	
Maguire 1983					<input type="checkbox"/>		
Maunsell 1996	<input type="checkbox"/>				<input type="checkbox"/>		
Purcell 2011	<input type="checkbox"/>		<input type="checkbox"/>				
Sachs 1980	<input type="checkbox"/>			<input type="checkbox"/>		<input type="checkbox"/>	
Tamminga 2013	<input type="checkbox"/>						<input type="checkbox"/>

FIGURE 3: METHODOLOGICAL QUALITY SUMMARY

	Selection bias	Performance bias	Detection bias	Attrition bias	Reporting bias	Other bias
Berglund 1994	+	+/-	+/-	+	--	--
Bottcher 2013	--	+/-	+/-	--	--	n/a
Capone 1980	--	+/-	+/-	--	--	n/a
Gordon 1980	--	+/-	+/-	+	--	n/a
Granstam-Bjorneklett 2013	+	+/-	+/-	--	+	n/a
Hubbard 2013	+	+/-	+	+	+	n/a
Lepore 2003	+	+/-	+	+	--	n/a
Maguire 1983	+	+/-	+/-	--	--	n/a
Maunsell 1996	+/-	+/-	+/-	+	+	n/a
Purcell 2011	+	+	+	+/-	+	n/a
Sachs 1980	--	+/-	+/-	+/-	--	n/a
Tamminga 2013	+	+/-	+/-	+	+	n/a

Note: + = low risk; +/- = unclear risk; -- = high risk

FIGURE 4: FUNNEL PLOTS ASSESSING PUBLICATION BIAS

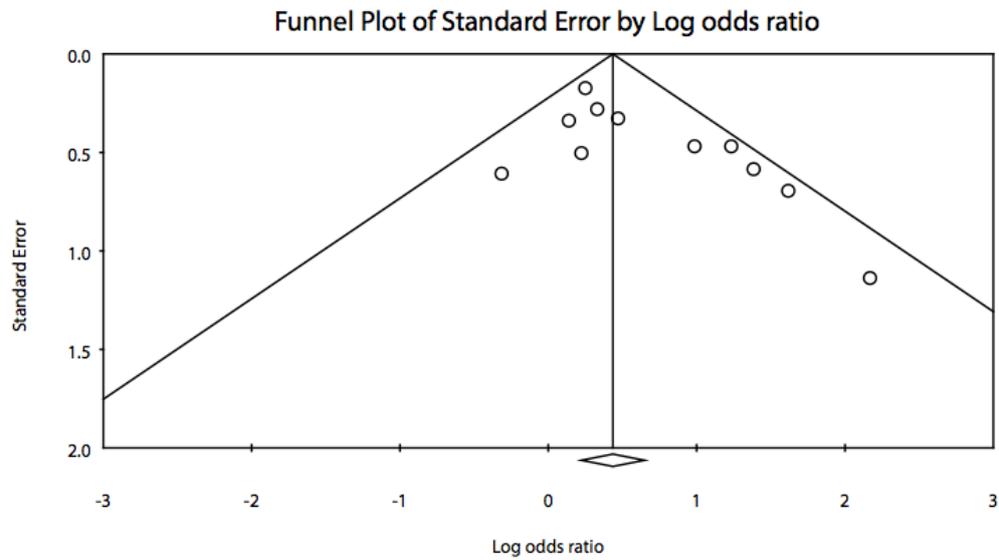


Figure 4.1. Funnel Plot for Studies with Employment Outcome

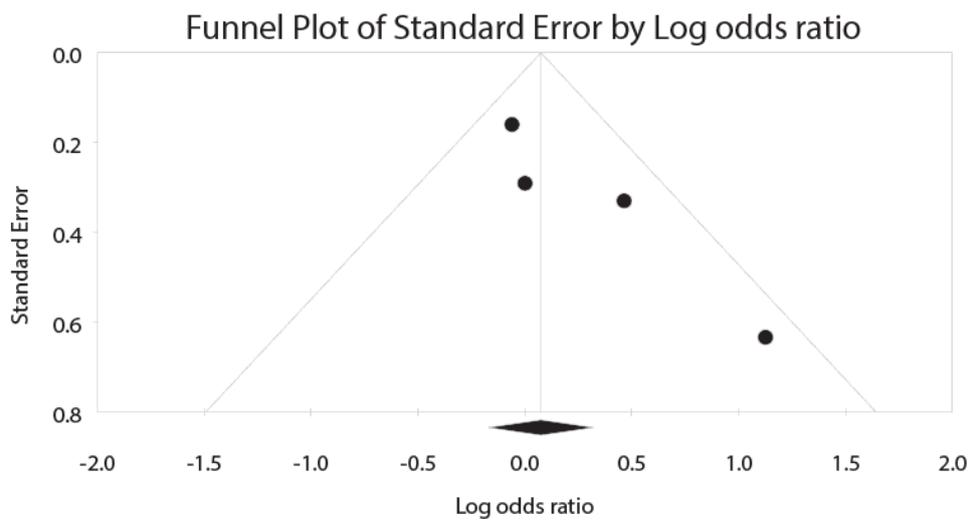


Figure 4.2. Funnel Plot for Studies with Hours Worked Outcome

Appendix A: Documentation of Search Strategies for the Systematic Review

Database	Date Searched	Years of Coverage	Country/ Supplier	Strategy
Abstracts of Review of Effectiveness (DARE)	Nov 2013	1960 - 2013	UK/CRD	((cancer* OR "cancer survivor" OR neoplasm* OR leukemia* OR carcinoma* OR oncog* OR tumor* OR tumour* OR sarcoma* OR lymphoma* OR melanoma* OR blastoma*) AND (interven* OR model* OR program* OR practice* OR train* OR "vocational rehabilitation" OR accommodat* OR "occupational therapy") AND (employ* OR "return-to-work" OR job OR wages OR salar* OR "sick leave" OR absenteeism) AND (RCT* OR experiment* OR "quasi-experiment*" OR "control group*" OR random* OR effect* OR comparison* OR efficacy*))
Academic Source Complete	Nov 2013	1865 - 2013	US/ EBSCOHOST	((cancer* OR "cancer survivor" OR neoplasm* OR leukemia* OR carcinoma* OR oncog* OR tumor* OR tumour* OR sarcoma* OR lymphoma* OR melanoma* OR blastoma*) AND (interven* OR model* OR program* OR practice* OR train* OR "vocational rehabilitation" OR accommodat* OR "occupational therapy") AND (employ* OR "return-to-work" OR job OR wages OR salar* OR "sick leave" OR absenteeism) AND (RCT* OR experiment* OR "quasi-experiment*" OR "control group*" OR random* OR effect* OR comparison* OR efficacy*))

Database	Date Searched	Years of Coverage	Country/ Supplier	Strategy
Academic One File	Nov 2013	1980 – 2013	US/ GALE	((cancer* OR "cancer survivor" OR neoplasm* OR leukemia* OR carcinoma* OR oncog* OR tumor* OR tumour* OR sarcoma* OR lymphoma* OR melanoma* OR blastoma*) AND (interven* OR model* OR program* OR practice* OR train* OR "vocational rehabilitation" OR accommodat* OR "occupational therapy") AND (employ* OR "return-to-work" OR job OR wages OR salar* OR "sick leave" OR absenteeism) AND (RCT* OR experiment* OR "quasi-experiment*" OR "control group*" OR random* OR effect* OR comparison* OR efficacy*))
Academic Search Complete	Nov 2013	1943 – 2013	US/ EBSCOHOST	((cancer* OR "cancer survivor" OR neoplasm* OR leukemia* OR carcinoma* OR oncog* OR tumor* OR tumour* OR sarcoma* OR lymphoma* OR melanoma* OR blastoma*) AND (interven* OR model* OR program* OR practice* OR train* OR "vocational rehabilitation" OR accommodat* OR "occupational therapy") AND (employ* OR "return-to-work" OR job OR wages OR salar* OR "sick leave" OR absenteeism) AND (RCT* OR experiment* OR "quasi-experiment*" OR "control group*" OR random* OR effect* OR comparison* OR efficacy*))
Business Source Complete	Nov 2013	1886 –2013	US/ EBSCOHOST	((cancer* OR "cancer survivor" OR neoplasm* OR leukemia* OR carcinoma* OR oncog* OR tumor* OR tumour* OR sarcoma* OR lymphoma* OR melanoma* OR blastoma*) AND (interven* OR model* OR program* OR practice* OR train* OR "vocational rehabilitation" OR accommodat* OR "occupational therapy") AND (employ* OR "return-to-work" OR job OR wages OR salar* OR "sick leave" OR absenteeism) AND (RCT* OR experiment* OR "quasi-experiment*" OR "control group*" OR random* OR effect* OR comparison* OR efficacy*))
CINAHL Plus with Full Text	Nov 2013	1943 – 2013	US/ EBSCOHOST	((cancer* OR "cancer survivor" OR neoplasm* OR leukemia* OR carcinoma* OR oncog* OR tumor* OR tumour* OR sarcoma* OR lymphoma* OR melanoma* OR blastoma*) AND (interven* OR model* OR program* OR practice* OR train* OR "vocational rehabilitation" OR accommodat* OR "occupational therapy") AND (employ* OR "return-to-work" OR job OR wages OR salar* OR "sick leave" OR absenteeism) AND (RCT* OR experiment* OR "quasi-experiment*" OR "control group*" OR random* OR effect* OR comparison* OR efficacy*))

Database	Date Searched	Years of Coverage	Country/ Supplier	Strategy
CIRRIE	Nov 2013	1990 – 2013	US/ University at Buffalo	cancer* AND employ* cancer* AND "return-to-work" cancer* AND job cancer* AND wages cancer* AND salar* cancer* AND sick leave" cancer* AND absenteeism
ClinicalTrials.gov	July 2013	2000 - 2013	US/NIH	(cancer* OR "cancer survivor" OR neoplasm* OR leukemia*) AND (vocation* OR employment* OR "return to work" OR salar* OR job OR "occupational therap*" OR occupation* OR train*)
Controlled-trials.com	July 2013	2000 – 2013	UK/Springer	(cancer AND employment) OR (cancer AND vocation) OR (cancer AND occupation) OR (cancer AND rehabilitation AND work) OR ((work OR employment OR vocation OR occupation) AND (therapy OR accommodation) AND (cancer OR leukemia OR neoplasm))
Cochrane Central Registry of Controlled Trials	Nov 2013	2005 – 2013	US/ The Cochrane Collaboration	((cancer* OR "cancer survivor" OR neoplasm* OR leukemia* OR carcinoma* OR oncog* OR tumor* OR tumour* OR sarcoma* OR lymphoma* OR melanoma* OR blastoma*) AND (interven* OR model* OR program* OR practice* OR train* OR "vocational rehabilitation" OR accommodat* OR "occupational therapy") AND (employ* OR "return-to-work" OR job OR wages OR salar* OR "sick leave" OR absenteeism) AND (RCT* OR experiment* OR "quasi-experiment*" OR "control group*" OR random* OR effect* OR comparison* OR efficacy*))
Educational Full Text	Nov 2013	1943 – 2013	US/ EBSCOHOST	((cancer* OR "cancer survivor" OR neoplasm* OR leukemia* OR carcinoma* OR oncog* OR tumor* OR tumour* OR sarcoma* OR lymphoma* OR melanoma* OR blastoma*) AND (interven* OR model* OR program* OR practice* OR train* OR "vocational rehabilitation" OR accommodat* OR "occupational therapy") AND (employ* OR "return-to-work" OR job OR wages OR salar* OR "sick leave" OR absenteeism) AND (RCT* OR experiment* OR "quasi-experiment*" OR "control group*" OR random* OR effect* OR comparison* OR efficacy*))

Database	Date Searched	Years of Coverage	Country/ Supplier	Strategy
Ed Line and Electronic Texts in Education	Nov 2013	1943 – 2013	UK/ PROQUEST	((cancer* OR "cancer survivor" OR neoplasm* OR leukemia* OR carcinoma* OR oncog* OR tumor* OR tumour* OR sarcoma* OR lymphoma* OR melanoma* OR blastoma*) AND (interven* OR model* OR program* OR practice* OR train* OR "vocational rehabilitation" OR accommodat* OR "occupational therapy") AND (employ* OR "return-to-work" OR job OR wages OR salar* OR "sick leave" OR absenteeism) AND (RCT* OR experiment* OR "quasi-experiment*" OR "control group*" OR random* OR effect* OR comparison* OR efficacy*))
EMBASE	Nov 2013	1943 - 2013	UK/Elsevier	((cancer* OR "cancer survivor" OR neoplasm* OR leukemia* OR carcinoma* OR oncog* OR tumor* OR tumour* OR sarcoma* OR lymphoma* OR melanoma* OR blastoma*) AND (interven* OR model* OR program* OR practice* OR train* OR "vocational rehabilitation" OR accommodat* OR "occupational therapy") AND (employ* OR "return-to-work" OR job OR wages OR salar* OR "sick leave" OR absenteeism) AND (RCT* OR experiment* OR "quasi-experiment*" OR "control group*" OR random* OR effect* OR comparison* OR efficacy*))
ERIC	Nov 2013	1966 – 2013	US/ EBSCOHOST	((cancer* OR "cancer survivor" OR neoplasm* OR leukemia* OR carcinoma* OR oncog* OR tumor* OR tumour* OR sarcoma* OR lymphoma* OR melanoma* OR blastoma*) AND (interven* OR model* OR program* OR practice* OR train* OR "vocational rehabilitation" OR accommodat* OR "occupational therapy") AND (employ* OR "return-to-work" OR job OR wages OR salar* OR "sick leave" OR absenteeism) AND (RCT* OR experiment* OR "quasi-experiment*" OR "control group*" OR random* OR effect* OR comparison* OR efficacy*))
Google (advanced)	March 2012	1943 – 2013	US	((cancer* OR "cancer survivor" OR neoplasm* OR leukemia* OR carcinoma* OR oncog* OR tumor* OR tumour* OR sarcoma* OR lymphoma* OR melanoma* OR blastoma*) AND (interven* OR model* OR program* OR practice* OR train* OR "vocational rehabilitation" OR accommodat* OR "occupational therapy") AND (employ* OR "return-to-work" OR job OR wages OR salar* OR "sick leave" OR absenteeism) AND (RCT* OR experiment* OR "quasi-experiment*" OR "control group*" OR random* OR effect* OR comparison* OR efficacy*))
Google Scholar	Feb 2012	1943 – 2013	US	((cancer* OR "cancer survivor" OR neoplasm* OR leukemia* OR carcinoma* OR oncog* OR tumor* OR tumour* OR sarcoma* OR lymphoma* OR melanoma* OR blastoma*) AND (interven* OR model* OR program* OR practice* OR train* OR "vocational rehabilitation" OR accommodat* OR "occupational therapy") AND (employ* OR "return-to-work" OR job OR wages OR salar* OR "sick leave" OR absenteeism) AND (RCT* OR experiment* OR "quasi-experiment*" OR "control group*" OR random* OR effect* OR comparison* OR efficacy*))

Database	Date Searched	Years of Coverage	Country/ Supplier	Strategy
OSH Update	Nov 2013	- 2013	UK/OVID	((cancer* OR "cancer survivor" OR neoplasm* OR leukemia* OR carcinoma* OR oncog* OR tumor* OR tumour* OR sarcoma* OR lymphoma* OR melanoma* OR blastoma*) AND (interven* OR model* OR program* OR practice* OR train* OR "vocational rehabilitation" OR accommodat* OR "occupational therapy") AND (employ* OR "return-to-work" OR job OR wages OR salar* OR "sick leave" OR absenteeism) AND (RCT* OR experiment* OR "quasi-experiment*" OR "control group*" OR random* OR effect* OR comparison* OR efficacy*))
Professional Development Collection	Nov 2013	1965 – 2013	US/ EBSCOHOST	((cancer* OR "cancer survivor" OR neoplasm* OR leukemia* OR carcinoma* OR oncog* OR tumor* OR tumour* OR sarcoma* OR lymphoma* OR melanoma* OR blastoma*) AND (interven* OR model* OR program* OR practice* OR train* OR "vocational rehabilitation" OR accommodat* OR "occupational therapy") AND (employ* OR "return-to-work" OR job OR wages OR salar* OR "sick leave" OR absenteeism) AND (RCT* OR experiment* OR "quasi-experiment*" OR "control group*" OR random* OR effect* OR comparison* OR efficacy*))
Proquest	Nov 2013	1971 - 2013	US/ PROQUEST	((cancer* OR "cancer survivor" OR neoplasm* OR leukemia* OR carcinoma* OR oncog* OR tumor* OR tumour* OR sarcoma* OR lymphoma* OR melanoma* OR blastoma*) AND (interven* OR model* OR program* OR practice* OR train* OR "vocational rehabilitation" OR accommodat* OR "occupational therapy") AND (employ* OR "return-to-work" OR job OR wages OR salar* OR "sick leave" OR absenteeism) AND (RCT* OR experiment* OR "quasi-experiment*" OR "control group*" OR random* OR effect* OR comparison* OR efficacy*))
Proquest Dissertation and Theses	Nov 2013	1971 - 2013	US/ PROQUEST	((cancer* OR "cancer survivor" OR neoplasm* OR leukemia* OR carcinoma* OR oncog* OR tumor* OR tumour* OR sarcoma* OR lymphoma* OR melanoma* OR blastoma*) AND (interven* OR model* OR program* OR practice* OR train* OR "vocational rehabilitation" OR accommodat* OR "occupational therapy") AND (employ* OR "return-to-work" OR job OR wages OR salar* OR "sick leave" OR absenteeism) AND (RCT* OR experiment* OR "quasi-experiment*" OR "control group*" OR random* OR effect* OR comparison* OR efficacy*))
Psychology and Behavioral Sciences Collection	Nov 2013	1965 – 2013	US/ EBSCOHOST	((cancer* OR "cancer survivor" OR neoplasm* OR leukemia* OR carcinoma* OR oncog* OR tumor* OR tumour* OR sarcoma* OR lymphoma* OR melanoma* OR blastoma*) AND (interven* OR model* OR program* OR practice* OR train* OR "vocational rehabilitation" OR accommodat* OR "occupational therapy") AND (employ* OR "return-to-work" OR job OR wages OR salar* OR "sick leave" OR absenteeism) AND (RCT* OR experiment* OR "quasi-experiment*" OR "control group*" OR random* OR effect* OR comparison* OR efficacy*))

Database	Date Searched	Years of Coverage	Country/ Supplier	Strategy
PsycINFO	Nov 2013	1943 – 2013	US/ EBSCOHOST	((cancer* OR "cancer survivor" OR neoplasm* OR leukemia* OR carcinoma* OR oncog* OR tumor* OR tumour* OR sarcoma* OR lymphoma* OR melanoma* OR blastoma*) AND (interven* OR model* OR program* OR practice* OR train* OR "vocational rehabilitation" OR accommodat* OR "occupational therapy") AND (employ* OR "return-to-work" OR job OR wages OR salar* OR "sick leave" OR absenteeism) AND (RCT* OR experiment* OR "quasi-experiment*" OR "control group*" OR random* OR effect* OR comparison* OR efficacy*))
PubMed/MEDLINE	Nov 2013	1943 – 2013	US/ EBSCOHOST	((cancer* OR "cancer survivor" OR neoplasm* OR leukemia* OR carcinoma* OR oncog* OR tumor* OR tumour* OR sarcoma* OR lymphoma* OR melanoma* OR blastoma*) AND (interven* OR model* OR program* OR practice* OR train* OR "vocational rehabilitation" OR accommodat* OR "occupational therapy") AND (employ* OR "return-to-work" OR job OR wages OR salar* OR "sick leave" OR absenteeism) AND (RCT* OR experiment* OR "quasi-experiment*" OR "control group*" OR random* OR effect* OR comparison* OR efficacy*))
Science and Technology Collection	Nov 2013	1943 – 2013	US/ EBSCOHOST	((cancer* OR "cancer survivor" OR neoplasm* OR leukemia* OR carcinoma* OR oncog* OR tumor* OR tumour* OR sarcoma* OR lymphoma* OR melanoma* OR blastoma*) AND (interven* OR model* OR program* OR practice* OR train* OR "vocational rehabilitation" OR accommodat* OR "occupational therapy") AND (employ* OR "return-to-work" OR job OR wages OR salar* OR "sick leave" OR absenteeism) AND (RCT* OR experiment* OR "quasi-experiment*" OR "control group*" OR random* OR effect* OR comparison* OR efficacy*))
Sociological Abstracts	Nov 2013	1952 – 2013	US/CSA	((cancer* OR "cancer survivor" OR neoplasm* OR leukemia* OR carcinoma* OR oncog* OR tumor* OR tumour* OR sarcoma* OR lymphoma* OR melanoma* OR blastoma*) AND (interven* OR model* OR program* OR practice* OR train* OR "vocational rehabilitation" OR accommodat* OR "occupational therapy") AND (employ* OR "return-to-work" OR job OR wages OR salar* OR "sick leave" OR absenteeism) AND (RCT* OR experiment* OR "quasi-experiment*" OR "control group*" OR random* OR effect* OR comparison* OR efficacy*))
Trialregister.nl	July 2013	- 2013	Netherlands	Vocational OR Occupational OR Employment OR Accommodation OR Return to work OR Re-employment OR Vocation OR Workplace OR Cancer

Database	Date Searched	Years of Coverage	Country/ Supplier	Strategy
Web of Science	Nov 2013	1943 – 2013	US/ Thomson Reuters	((cancer* OR "cancer survivor" OR neoplasm* OR leukemia* OR carcinoma* OR oncog* OR tumor* OR tumour* OR sarcoma* OR lymphoma* OR melanoma* OR blastoma*) AND (interven* OR model* OR program* OR practice* OR train* OR "vocational rehabilitation" OR accommodat* OR "occupational therapy") AND (employ* OR "return-to-work" OR job OR wages OR salar* OR "sick leave" OR absenteeism) AND (RCT* OR experiment* OR "quasi-experiment*" OR "control group*" OR random* OR effect* OR comparison* OR efficacy*))
WorldCat [for monographs]	Nov 2013	1943 – 2013	US/ OCLC	((cancer* OR "cancer survivor" OR neoplasm* OR leukemia* OR carcinoma* OR oncog* OR tumor* OR tumour* OR sarcoma* OR lymphoma* OR melanoma* OR blastoma*) AND (interven* OR model* OR program* OR practice* OR train* OR "vocational rehabilitation" OR accommodat* OR "occupational therapy") AND (employ* OR "return-to-work" OR job OR wages OR salar* OR "sick leave" OR absenteeism) AND (RCT* OR experiment* OR "quasi-experiment*" OR "control group*" OR random* OR effect* OR comparison* OR efficacy*))
Yahoo! (advanced)	Nov 2013	1943 – 2013	US	((cancer* OR "cancer survivor" OR neoplasm* OR leukemia* OR carcinoma* OR oncog* OR tumor* OR tumour* OR sarcoma* OR lymphoma* OR melanoma* OR blastoma*) AND (interven* OR model* OR program* OR practice* OR train* OR "vocational rehabilitation" OR accommodat* OR "occupational therapy") AND (employ* OR "return-to-work" OR job OR wages OR salar* OR "sick leave" OR absenteeism) AND (RCT* OR experiment* OR "quasi-experiment*" OR "control group*" OR random* OR effect* OR comparison* OR efficacy*))

Appendix B: Coding Form

Full Citation (APA style):

Is this a study of a behavioural, psychological, educational or vocational intervention?

- Yes
- Unclear
- No, then STOP!

Were the participants aged 18 years or older?

- Yes
- Unclear
- No, then STOP!

Were the participants cancer survivors?

- Yes
- Unclear
- No, then STOP!

Does the study measure rate of employment or report time-to-event data such as number of leave days taken?

- Yes
- Unclear
- No, then STOP!

I. Publication Source:

- Journal Article
- Conference paper
- Master/Doctoral Thesis
- Technical Report
- Organizational Report
- Book or Book Chapter
- Other:

II. Subject Characteristics (pg.)

Group	Mean age (yr.; mos.)	%Male	Pretest (n)	Post-test (n)	Attrition (n)	1 st Follow-up (n)	F Attrition (n)
-------	----------------------	-------	-------------	---------------	---------------	-------------------------------	-----------------

Group-T:

Group-CP:

Group-CO:

Note: For groups, T=treatment, CP=comparison, and CO=control . “Attrition” is the difference between the pretest and post-test “n” and “F_Attrition” is the difference between the post-test and 1st follow-up “n.”

Comments:

III. Sample Source (pg.)

- Hospital/clinic
- Government service agency
- Non-governmental organization
- General public
- Not Reported
- Other

Comments:

IV. SES (pg.)

- | | | |
|---------------------------------------|--|---------------------------------------|
| <input type="checkbox"/> Low | <input type="checkbox"/> Upper | <input type="checkbox"/> Unclear |
| <input type="checkbox"/> Low-Middle | <input type="checkbox"/> Labeled Mixed | <input type="checkbox"/> Not Reported |
| <input type="checkbox"/> Middle | <input type="checkbox"/> Unlabeled | |
| <input type="checkbox"/> Middle-Upper | Mixed | |

Comments:

V. Education (pg.) Less than high school graduate

- | | |
|---|--|
| <input type="checkbox"/> High School Graduate | <input type="checkbox"/> More than college diploma |
| <input type="checkbox"/> Some College | <input type="checkbox"/> Other: |
| <input type="checkbox"/> College Diploma | <input type="checkbox"/> Not reported |

Comments:

VI. Study Community Setting (pg.)

- Urban Suburban Rural Mixed Not reported

Comments:

Geographic Setting:

VII. Participant Type of Cancer (pg.) Bladder

- | | | |
|--|--------------------------------------|--|
| <input type="checkbox"/> Breast | <input type="checkbox"/> Melanoma | <input type="checkbox"/> Skin |
| <input type="checkbox"/> Colon and rectal | <input type="checkbox"/> Non-Hodgkin | (nonMelanoma) |
| <input type="checkbox"/> Endometrial | Lymphoma | <input type="checkbox"/> Thyroid |
| <input type="checkbox"/> Kidney (Renal cell) | <input type="checkbox"/> Pancreatic | <input type="checkbox"/> Other |
| <input type="checkbox"/> Leukemia | <input type="checkbox"/> Prostate | <input type="checkbox"/> Mixed |
| <input type="checkbox"/> Lung | | <input type="checkbox"/> Not specified |

VIII. Treatment History (pg.)

- | | |
|--|--|
| <input type="checkbox"/> Surgery | <input type="checkbox"/> Chemotherapy |
| <input type="checkbox"/> Radiation | <input type="checkbox"/> Alternative/complementary |
| <input type="checkbox"/> Oral medication (including oral chemotherapy) | <input type="checkbox"/> Mixed |
| <input type="checkbox"/> Not Reported | |

Comments:

XIa. Intervention Setting (pg.)

- Hospital/clinic
- Home
- Workplace
- Mixed
- Not Reported
- Govt. service agency
- Nongovernmental agency
- Online
- Other

XIb. Intervention Facilitator (pg.)

- Medical practitioner
- Self
- Human resource staff
- Team
- Not Reported
- Social worker
- Psychologist
- Vocational rehabilitation counselor
- Other

XIc. Participation Mode (pg.)

- Individual
- Mixed
- Not Reported
- Group
- Other

XId. Were there medical/physical elements to the intervention (pg.)

- Yes
- No
- If Yes, please describe: _____

XIe. Costs of the Intervention

Describe: _____

XII. Primary Type of Employment:

Wholesale Trade

Retail Trade

Transportation & Warehousing

Information

Finance

Professional

Education & health

Leisure & Hospitality

Other Service:

Goods-processing Industries

Construction

Manufacturing

Other Service:

Public Administration

Local government

State government

Federal government

Other Service:

Comments:

XIII. Employment Outcome Measure(s):

Employment outcome:

Obtaining new employment

Maintaining current employment

1. Number of days to Place in Employment or Maintenance of Employment:

2. Number of Months Employed:

3. Re-employments Included: Yes No Not Reported

4. Employment Status: % Full Time % Part Time

5. Mean hours worked per week:

6. Mean post-placement Hourly Wages:

7. Mean dropped Out Before Placement Occurred:

8. Employer Evaluation:

9. Co-Worker Evaluation:

10. Participant Evaluation:

Comments:

XIV. Research Design Characteristics (pg.):

Which of the following research design types were used to examine the impact of program effects for employment placement?

- RCT Group Randomized Design
- Quasi-Experiment: Equivalent Comparison Design (groups)
- Quasi-Experiment: Nonequivalent Comparison Design (groups)
- Quasi-Experiment: Regression Discontinuity
- Other Design:
Comments:

XVa. Method of Random Assignment (pg.):

- Random Number Generation
- Coin Flip
- Envelope
- Other
- NR

Comments:

XVb. Level of Random Assignment (pg.):

- Individual
- Session
- Group
- Other
- NR

XIX. Effect Size Characteristics (Use d-Index Value if Provided)

Groups Compared: **Group 1:** **Group 2:**

Outcomes

Groups	1	2	1	2	1	2	1	2
% employed	_____	_____	_____	_____	_____	_____	_____	_____
Mean	_____	_____	_____	_____	_____	_____	_____	_____
SD	_____	_____	_____	_____	_____	_____	_____	_____
N-Post	_____	_____	_____	_____	_____	_____	_____	_____
N-Follow-up 1	_____	_____	_____	_____	_____	_____	_____	_____
N-Follow-up 2	_____	_____	_____	_____	_____	_____	_____	_____
N-Follow-up 3	_____	_____	_____	_____	_____	_____	_____	_____
N-Follow-up 4	_____	_____	_____	_____	_____	_____	_____	_____
d-index	_____	_____	_____	_____	_____	_____	_____	_____
F value	_____	_____	_____	_____	_____	_____	_____	_____
Chi-square	_____	_____	_____	_____	_____	_____	_____	_____
p value	_____	_____	_____	_____	_____	_____	_____	_____
t value	_____	_____	_____	_____	_____	_____	_____	_____
U value	_____	_____	_____	_____	_____	_____	_____	_____

Method of Analysis (pg.)

Intention to Treat: 0=no 1=yes

Treated Participants Only 0=no 1=yes

XX. Length of Follow-up (in days)

Follow-up 1 _____

Follow-up 2 _____

Follow-up 3 _____

Follow-up 4 _____

Comments:

Appendix C: Reasons Stage 2 Studies were Excluded from the Systematic Review

Reason for Exclusion: *Not an intervention study* (n = 22)

Alfano, Catherine M., & Rowland, Julia H. (2009). The experience of survival for patients: Psychosocial adjustment. In S. M. Miller, D. J. Bowen, R. T. Croyle & J. H. Rowland (Eds.), *Handbook of cancer control and behavioral science: A resource for researchers, practitioners, and policymakers*. (pp. 413-430). Washington, DC US: American Psychological Association.

Awadalla, A. W., Ohaeri, J. U., Gholoum, A., Khalid, A. O., Hamad, H. M., & Jacob, A. (2007). Factors associated with quality of life of outpatients with breast cancer and gynecologic cancers and their family caregivers: A controlled study. *BMC Cancer*, 7(1), 102-116.

de Boer, Agem, Verbeek, Jham, & van Dijk, F. J. H. (2006). Adult survivors of childhood cancer and unemployment - A meta-analysis. *Cancer*, 107(1), 1-11.

de Boer, A. G., Taskila, T. K., Tamminga, S. J., Frings-Dresen, M. H., Feuerstein, M., & Verbeek, J. H. (2011). Interventions to enhance return-to-work for cancer patients. *Cochrane Database of Systematic Reviews*.

DeLorenze, G. N., & Satariano, W. A. (1996). The likelihood of returning to work after breast cancer. *Public Health Reports*, 111, 236-241.

Egan, M. Y., McEwen, S., Sikora, L., Chasen, M., Fitch, M., & Eldred, S. (2013). Rehabilitation following cancer treatment. *Disability and Rehabilitation*. doi: 10.3109/09638288.2013.774441

Fantoni, S. Q., Peugniez, C., Duhamel, A., Skrzypezak, J., Frimat, P., & Leroyer, A. (2010). Factors related to return to work by women with breast cancer in northern France. *Journal of Occupational Rehabilitation*, 20, 49-58.

Gobelet, C., & Franchignoni, F. (2006). *Vocational Rehabilitation the Different European Models*. Springer: France.

Hansen, Jennifer A., Feuerstein, Michael, Calvio, Lisseth C., & Olsen, Cara H. (2008). Breast cancer survivors at work. *Journal of Occupational and Environmental Medicine*, 50(7), 777-784. doi: 10.1097/JOM.0b013e318165159e

Hoving, J. L., Broekhuizen, M. L. A., & Frings-Dresen, M. H. W. (2009). Return to work of breast cancer survivors: a systematic review of intervention studies. *Bmc Cancer*, 9, 1-10.

Dolyniuk, C. A., Kamens, M. W., Corman, H., DiNardo, P. O., Totaro, R. M., & Rockoff, J. C. (2002). Students with developmental disabilities go to college: Description of a collaborative transition Project on a regular college campus. *Focus on Autism and Other Developmental Disabilities*, 17(4), 236-241.

Jones, D. L., Tanigawa, T., & Weiss, S. M. (2003). Stress management and workplace disability in the US, Europe and Japan. *Journal of Occupational Health*, 45(1), 1-7. doi: 10.1539/joh.45.1

Kyle, R. G., Culbard, B., Evans, J., Gray, N. M., Ayansina, D., & Hubbard, G. (2011). Vocational rehabilitation services for patients with cancer: design of a feasibility study incorporating a pilot randomised controlled trial among women with breast cancer following surgery. *Trials*, 12, 89-89. doi: 10.1186/1745-6215-12-89

Mayer, D. K. (2011). The importance of work. *Clinical Journal of Oncology Nursing*, 13(6), 607. Doi: 10.1188/09.CJON.607

Moskowitz, M. C., Todd, B. L., & Feuerstein, M. (2012). *Cancer survivors and work*. In R. J. Gatchel & I. Z. Schultz (Eds.), *Handbook of occupational health and wellness*. (pp. 131-150). New York, NY US: Springer Science + Business Media.

Munir, F., Kalawsky, K., Lawrence, C., Yarker, J., Haslam, C., & Ahmed, S. (2011). Cognitive intervention for breast cancer patients undergoing adjuvant chemotherapy: A needs analysis. *Cancer Nursing*, 34(5), 385-392. doi: 10.1097/NCC.0b013e31820254f3

Noordegraaf, A. V. et al. (2012). Effectiveness of a multidisciplinary care program on recovery and return to work of patients after gynaecological surgery; design of a randomized trial. *BMC Health Services Research*, 12(29), 1-13.

Smith, K. B., & Pukall, C. F. (2009). An evidence-based review of Yoga as a complementary intervention for patients with cancer. *Psycho-Oncology*, 18(5), 465-475. doi: 10.1002/pon.1411

Tamminga, S. J., de Boer, A. G., Verbeek, J. H., & Frings-Dresen, M. H. (2010). Return-to-work interventions integrated into cancer care: a systematic review. *Occupational & Environmental Medicine*, 67(9), 639-648. doi: 10.1136/oem.2009.050070

Tamminga, S. J., de Boer, A. G., Verbeek, J. H., Taskila, T., & Frings-Dresen, M. H. (2010). Enhancing return-to-work in cancer patients, development of an intervention and design of a randomised controlled trial from <http://www.biomedcentral.com/1471-2407/10/345>

Verbeek, J. H. (2006). How can doctors help their patients to return to work? *PLoS Medicine*, 3(3), 312-315. doi: 10.1371/journal.pmed.0030088

Whatley, P., & Milne, R. (1998). *Psycho-social interventions in oncology: counselling services for women with breast cancer*. Southampton: Wessex Institute for Health Research and Development (WIHRD).

Reason for Exclusion: Outcomes were not employment (n = 23)

Anderson, R. T., Kimmick, G. G., McCoy, T. P., Hopkins, J., Levine, E., Miller, G., et al. (2012). A randomized trial of exercise on well-being and function following breast cancer surgery: The RESTORE trial. *Journal of Cancer Survivorship*, 6, 172-181.

Atlantis, E., Chow, C.-M., Kirby, A., & Singh, M. F. (2004). An effective exercise-based intervention for improving mental health and quality of life measures: A randomized controlled trial. *Preventive Medicine*, 39, 424-434.

Bains, M., Munir, F., Yarker, J., Steward, W., & Thomas, A. (2011). Return-to-Work guidance and support for colorectal cancer patients. *Cancer Nursing*, 34(6), 1-4.

-
- Campbell, H. S., Phanuef, M. R., & Deane, K. (2004). Cancer peer support programs—do they work? *Patient Education and Counseling*, 55, 3-15.
-
- Gordon, L. G., Scuffham, P., Battistutta, D., Graves, N., Tweeddale, M., & Newman, B. (2005). A cost-effectiveness analysis of two rehabilitation support services for women with breast cancer. *Breast Cancer Research and Treatment*, 94(2), 123-133.
-
- Jacobsen, P. B., Meade, C. D., Stein, K. D., Chirikos, T. N., Small, B. J., & Ruckdeschel, J. C. (2002). Efficacy and costs of two forms of stress management training for cancer patients undergoing chemotherapy. *Journal of Clinical Oncology*, 20(12), 2851-2862.
-
- Joly, L. (2009). Effects of exercise on quality of life in women living with breast cancer: a systematic review. *Primary Health Care*, 19, 14.
-
- Kim, S. C. (2011). Meeting psychosocial needs of cancer patients through integrated e-health intervention: A theory-based mediation approach. (Ph.D.), The University of Wisconsin – Madison, United States – Wisconsin
-
- Lariviere, Manon. (2002). Evaluation d'un programme Qualite de vie en oncologie en regard de la qualite de vie des personnes de 50 ans et plus atteintes d'un cancer. (MQ74436 M.A.), Universite de Sherbrooke (Canada), Ann Arbor
-
- Meraviglia, M., Stuijbergen, A., Parsons, D., & Morgan, S. (2013). Health promotion for cancer survivors: adaptation and implementation of an intervention. *Holistic Nursing Practice*, 27(3), 140-147. Doi: 10.1097/HNP.0b013e31828a0988
-
- Neises, M., Ditz, S., Scheck, T., Schiller, A., & Nebe, C. T. (2001). Consenters and decliners of an intervention group after breast cancer surgery differ in terms of quality of life, coping and immunological functional assays [German – Teilnehmerinnen und Ablehnerinnen einer Interventionsgruppe nach Mammakarzinom unterschieden sich in Lebensqualität, Krankheitsbewältigung und immunologischen Funktionsuntersuchungen. *Zentralbl Gynakol*, 123, 27-36.
-
- Otis-Green, S., Ferrell, B., Sun, V., Spolum, M., Morgan, R., & Macdonald, D. (2008). Feasibility of an ovarian cancer quality-of-life psychoeducational intervention. *Journal of Cancer Education*, 23(4), 214-221.
-
- Reif, K., de Vries, U., Petermann, F., & Görres, S. (2013). A patient education program is effective in reducing cancer-related fatigue: A multi-centre randomised two-group waiting-list controlled intervention trial. *European Journal of Oncology Nursing*, 17(2), 204-213. doi: 10.1016/j.ejon.2012.07.002
-
- Ritz, L. J., Nissen, M. J., Swenson, K. K., Farrell, J. B., Sperduto, P. W., Sladek, M. L., . . . Schroeder, L. M. (2000). Effects of advanced nursing care on quality of life and cost outcomes of women diagnosed with breast cancer. *Oncology Nursing Forum*, 27(6), 923-932.
-
- Ryhanen, A. M., Rankinen, S., Sikkinen, M., Saarinen, M., Korvenranta, H., Leino-Kilpi, H. (2013). The impact of an empowering Internet-based Breast Cancer Patient Pathway program on breast cancer patients' clinical outcomes: a randomised controlled trial. *Journal of Clinical Nursing*, 22, 1016-1025.
-
- Salonen, P., Kellokumpu-Lehtinen, P. L., Tarkka, M. T., Koivisto, A. M., & Kaunonen, M. (2011). Changes in quality of life in patients with breast cancer. *Journal of Clinical Nursing*, 20(1-2), 255-266. doi: 10.1111/j.1365-2702.2010.03422.x
-
- Salonen, P., Tarkka, M. T., Kellokumpu-Lehtinen, P. L., Koivisto, A. M., Aalto, P., & Kaunonen, M. (2013). Effect of social support on changes in quality of life in early breast cancer patients: A longitudinal study. *Scandinavian Journal of Caring Sciences*, 27(2), 396-405. doi: 10.1111/j.1471-6712.2012.01050.x
-

Salonen, P., Tarkka, M.-T., Kellokumpu-Lehtinen, P.-L., Åstedt-Kurki, P., Luukkaala, T., & Kaunonen, M. (2009). Telephone intervention and quality of life in patients with breast cancer. *Cancer Nursing*, 32(3), 177-192. doi: 10.1097/NCC.0b013e31819b5b65

Salonen, P., Tarkka, M.-T., Kellokumpu-Lehtinen, P.-L., Koivisto, A.-M., Åstedt-Kurki, P., & Kaunonen, M. (2011). Individual face-to-face support and quality of life in patients with breast cancer. *International Journal of Nursing Practice*, 17(4), 396-410. doi: 10.1111/j.1440-172X.2011.01948.x

Schuldheis, S. (2001). Economic evaluation of a telephone delivered self-help nursing intervention... 34th Annual Communicating Nursing Research Conference/15th Annual WIN Assembly, "Health Care Challenges Beyond 2001: Mapping the Journey for Research and Practice," held April 19-21, 2001 in Seattle, Washington. *Communicating Nursing Research*, 34, 223-223.

Suggs, T. F., Cable, T. A., & Rothenberger, L. A. (1990). Results of a work-site educational and screening program for hypertension and cancer. *Journal of Occupational Medicine*, 32(3), 220-225.

Tamminga, S. J., de Boer, A. G. E. M., Bos, M. M. E. M., Fons, G., Kitzen, J. J. E. M., Plaisier, P. W., . . . Frings-Dresen, M. H. W. (2012). A hospital-based work support intervention to enhance the return to work of cancer patients: A process evaluation. *Journal of Occupational Rehabilitation*, 22(4), 565-578. doi: 10.1007/s10926-012-9372-2

Walsh, M. C. (2011). Survivorship Care Plans: Exploring Lymphoma Patients' Knowledge of their Disease and Follow -up. from <http://hdl.handle.net/10090/22404>

Reason for Exclusion: Medical Intervention (n = 6)

Cao, S., Zhao, G., Cui, J., Dong, Q., Qi, S., Xin, Yi., Shen, B., & Guo, Q. (2013). Fast-track rehabilitation program and conventional care after esophagectomy: A retrospective controlled cohort study. *Support Care Cancer*, 21, 707-714.

Choinzonov, E. L., Balatskaia, L. N., Krasavina, E. A., & Chuzhevskaja, S. (2008). Quality of life in laryngectomized patients after vocal rehabilitation. [Russian] *Vopr Onkol*, 54(2), 211-215.

Karger, S. (2004). Anti-Angiogenese mit Bevacizumab: Durchbruch in der palliativen Therapie. *PharmaForum in Onkologie*, 27(6).

O'Rourke, J. (2011). A comparison of the effects of video prompting with and without error correction on vocational skill acquisition for individuals with moderate to profound intellectual disabilities. MA Thesis. The Ohio State University, Columbus – Ohio.

Richter, S. M. (2008). Effects of multimedia social stories on knowledge of adult outcomes and opportunities among transition-aged youth with significant cognitive disabilities. PhD Dissertation, The University of North Carolina, Charlotte – North Carolina.

Zakharyan, A. G., Stolyarov, V. I., & Kolosov, A. E. (1994). Vocational rehabilitation of patients after radical operation for stomach carcinoma. [Russian]. *Khirurgija (Sofia)*, 2(11-2)

Reason for Exclusion: No control group (n = 7)

Fismen, K., Osland, I. J., Fismen, E., Borge, L., Martinsen, E. W., Hjort, P., Iversen, O. E., & Stanghelle, J. K. (2000). [Rehabilitation of women with breast cancer]. *Tidsskr Nor Laegeforen*, 120(23), 2749-2754.

Fismen, K., & Stanghelle, J. K. (2007). [Rehabilitation of women with breast cancer; five-year follow-up]. *Tidsskr Nor Laegeforen*, 127(9), 1207-1209.

Lee, R. K. Y., & Chan, C. C. H. (2005). Factors affecting vocational outcomes of people with chronic illness participating in supported competitive open employment program in Hong Kong. *Work*, 25, 359-368.

McGee-Snyder, M. M. d. B. (2001). A case study in the use of gentle teaching: A prelude to career preparation. PhD Dissertation, University of Nebraska, Lincoln – Nebraska.

Mehnert, A., & Koch, U. (in press). Work satisfaction and quality of life in cancer survivors in the first year after oncological rehabilitation. *Work*. doi: 10.3233/wor-131676

Nieuwenhuijsen, K., Bos-Ransdorp, B., Uitterhoeve, L. L. J., Sprangers, M. A. G., & Verbeek, Jham. (2006). Enhanced provider communication and patient education regarding return to work in cancer survivors following curative treatment: A pilot study. *Journal of Occupational Rehabilitation*, 16(4), 647-657. doi: 10.1007/s10926-006-9057-9

Ryndak, D. L., Ward, T., Alper, S., Montgomery, J. W., & Storch, J. F. (2010). Long-term outcomes of services for two persons with significant disabilities with differing educational experiences: A qualitative consideration of the impact of educational experiences. *Education and Training in Autism and Developmental Disabilities*, 45(3), 323-338.

Reason for Exclusion: No cancer diagnosis (n = 3)

Herbig, B., Glaser, J., & Angerer, P. (2012). Old, sick, unemployed, without a chance? Results of a randomised controlled trial of the effects of a combined health and employment promotion program for the older long-term unemployed (AmigA-M). *Alt, krank, arbeitslos, chancenlos? Ergebnisse einer randomisierten Kontrollstudie zur Wirksamkeit einer kombinierten Gesundheits- und Arbeitsförderung bei älteren Langzeitarbeitslosen (AmigA-M)*, 55(8), 970-979.

McDonald, M. & Feldman, P. (2002). Translating research into practice: Report on initiative sponsored by AHRQ. Abstract presented at the 55th Annual Scientific Meeting of The Gerontologist.

Varekamp, I., Verbeek, J. H., de Boer, A., & van Dijk, F. J. H. (2011). Effect of job maintenance training program for employees with chronic disease – a randomized controlled trial on self-efficacy, job satisfaction, and fatigue. *Scandinavian Journal of Work, Environment and Health*, 37(4), 288-297.
