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Review

The effects of physical self-management on quality of life in breast cancer patients: A systematic review

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ABSTRACT

The aim of this systematic review is to report on the effects of different physical self-management techniques on quality of life (QoL) of patients with breast cancer. Therefore a systematic literature search was performed using four different databases (PubMed, Cochrane, Embase, Web of science). The inclusion criteria were: 1) adults >18 y, 2) patients with breast cancer, 3) physical self-management techniques during or after initial treatment, 4) outcome measure needed to be an indicator of patients' quality of life 5), Randomized Controlled Trials of all ages. The methodological quality of the selected articles was assessed. The results concerning quality of life outcomes were extracted. A total of 13 RCT's, representing 2180 participants were included. Different self-management techniques were identified such as a booklet, brochure, multimedia and recommendations. Disregarding the type of intervention, most studies found a positive effect of physical activity on QoL outcomes such as fatigue, physical functioning, emotional and/or social wellbeing. The results of the interventions during or after primary treatment of breast cancer are discussed separately. Studies that started their intervention during primary treatment found an improvement in QoL or a slower decrease in QoL. Studies that started the intervention after primary treatment found an increase in QoL. In conclusion, physical self-management interventions during breast cancer treatment as well as after the primary treatment seem to generate beneficial effects on QoL.

Introduction

Breast cancer is the most common cancer among women in Europe with an incidence of 89.7 per 100.000 [1]. Due to better screening services and improved treatment, the mortality rate has decreased and survival rates have increased accordingly [2]. When survival rates improve, the Quality of Life (QoL) of these patients becomes a key element in the treatment. Unfortunately, QoL is hampered by the morbidities caused breast cancer treatment [3–6]. Common morbidities described in the scientific literature are fatigue, hot flashes, pain, sexual dysfunction, arthralgia, neuropathy, cognitive dysfunction, lymphedema, cardiac morbidity, numbness, tightness in breast, loss of range of motion, fatigue, psychological problems [6–13]. A number of these problems persist at a high rate even one year after treatment [4,14–17]. Due to morbidities, breast cancer patients will experience a decrease in QoL; a generic term that implies physical, psychological and social aspects of daily life.

Self-care or self-management could be an important tool to minimize the number of morbidities in breast cancer treatment. Dean et al. stated that self-care not only includes health maintenance, lifestyle behaviour, utilization of preventive services, symptom evaluation, and various self-treatment activities. Additionally, an interaction with the professional sector is warranted [18]. Different definitions of self-care or self-management are available. A common definition is “the systematic provision of education and supportive interventions by health care staff to increase patients' skills and confidence in managing their health problems, including regular assessment of progress and problems,

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goal setting and problem-solving support" [19]. The importance in this definition is that the patient is in control of his own health. In the current review we will explore self-management techniques that focus on the use of physical activities as a self-management intervention. It is important that patients are responsible for executing, at least part of the intervention. Physical activities can be seen as a universally applicable self-management technique. Most of the breast cancer survivors remain physically inactive after treatment [20]. Physical inactivity implies side-effects such as decrease in muscle strength, fatigue, weakness, decrease in aerobic capacity and decrease in bone density [21]. Research has shown that physical activity is positively related to QoL [22,23]. Additionally, several studies provide evidence that physical activity or exercises are beneficial in breast cancer patients and has an impact on many different domains that influence health related QoL (HRQoL) [24–28]. The next step is to understand whether self-management by physical activities has the same effect as supervised exercises. Therefore, this systematic review focuses on the available evidence of physical self-management techniques used in breast cancer patients. The following research question was addressed: 'What are the existing self-management programs based upon physical activity and what are the effects of these programs on the QoL in breast cancer patients?

Method

Literature search and selection

A systematic literature search based upon the PRISMA (www.prisma-statement.org) guidelines, was performed using four different electronic databases: Pubmed, Web of Science, EMBASE and the Cochrane library for clinical trials. All searches were performed in August 2015. To define relevant keywords a PICO(S) method (http://editorial-unit.cochrane.org/cochrane-pico) was used. The following keywords were combined in a Boolean search: 'breast cancer'(P), 'self-management'(I), 'self-care'(I), 'training programs'(I), 'quality of life'(O) and 'activities of daily living'(O). Further elaboration on the search strategies can be found in Table 1. We limited our review to articles written in English or Dutch. Titles and abstracts were independently assessed twice to determine relevance to the topic of this review. Two raters (P.N. and S.V.D.) screened the selected full-text articles, based on the inclusion and exclusion criteria listed in Table 2. In case the raters had diverging opinions, consensus was sought during a meeting. A detailed flowchart of the search and study selection is provided in Fig. 1.

Quality assessment

The methodological quality of the selected studies was assessed independently by 2 researchers (PN and SVD). The checklist (10 items) for randomized controlled trial provided by the Dutch Cochrane Centre (http://Netherlands.cochrane.org/) was used to score all studies. An item was rated "1" if sufficient information was available and bias was unlikely. An item was rated "0" if it was certain that a criterion was lacking. An item was rated "?" if no information was available. If disagreement persisted about the assignment of a score to an item, a consensus meeting was held. The total quality is expressed as the sum of all criteria that were scored "1"; see Table 3. The level of evidence was determined for every study [29].

Results

Selection of studies

Initially, the search yielded 1209 references. After removal of duplicates and a first screening, 60 abstracts were selected of which full texts were retrieved. Two reviewers independently assessed the full texts based upon the defined criteria (see Table 2); finally a total of 13 RCT-studies [30–42] were included in this review, representing in total 2180 participants. The literature search and study selection process are shown in Fig. 1.

Methodological quality

The risk of bias and the level of evidence of the different studies are reported in Table 3. In all cases, the two researchers agreed. Scores for study quality ranged from 5/10 to 10/10 with a median score of 7/10. The item that was scored negatively in most studies: 'Were patients and clinicians blinded to the treatment/trial? Two studies [31,36] scored level A2 of evidence while all other studies scored level B, according to the Dutch Cochrane Centre guidelines.

Assessment methods

Different questionnaires were used to measure outcomes related to QoL. Table 3 includes an overview of the questionnaires used as an assessment in the selected articles.

Types of interventions

Different kinds of interventions were found. Nine studies described an intervention that was executed by the patients at home independently [30–33,35–38,41,42]. Among these 9 studies different methods were used: a web based program [36], information sessions [30], multimedia [31,33], information sessions and booklets [37,38] and recommendations [35].

Several studies provided a combination of methods to introduce the physical intervention [32,41,42]. Four studies used a supervised and home-based intervention [32,34,39,40]. Only one study had a three-arm design with an isolated home-based intervention, a supervised intervention and a control group [40]. The used interventions are incomparable; therefore the specific results of each study are listed in Table 3.

Table 1
Overview of the boolean search strategies in different databases used.

Pubmed	("breast neoplasms"[MeSH] OR "breast neoplasms"[All Fields] OR "breast cancer"[All Fields]) AND ("self-care"[MeSH] OR "self care"[All Fields] OR "self-management"[All Fields] OR "self-education"[All Fields] OR "education"[Subheading]) AND ("quality of life"[MeSH] OR "quality of life"[All Fields] OR "activities of daily living"[MeSH] OR "activities of daily living"[All Fields])
Web of Science	TS=("breast neoplasms" OR "breast cancer") AND TS=("self-care" OR "self-management" OR "self-education" OR "training programs" OR "training program" OR "courses") AND TS=("quality of life" OR "activities of daily living")
EMBASE	('breast neoplasms' OR 'breast cancer') AND ('self care' OR 'self management' OR 'self education' OR 'training program' OR 'training programs' OR 'courses') AND ('quality of life' OR 'activities of daily living')
Cochrane Library for clinical trials	(breast neoplasms OR breast cancer) AND (self care OR self management OR self education OR patient education) AND (quality of life OR activities of daily living)

TS = Topic Specific.