The influence of Psychosocial Barriers on Physical Activity level and frequency among Breast Cancer Survivors.

Bachelor thesis Clinical Health Psychology

Department Psychology & Health
Medical psychology
Tilburg University
June 2012

Author: Hiske Geerts
Supervisor: Olga Husson
Abstract

**Background:** Physical activity is a well-recognized quality-of-life intervention in breast cancer survivors. Physical activity increases functional capacity and decreases side effects of treatment. Importantly, exercise after cancer diagnosis is associated with decreased mortality.

**Design:** The author systematically reviewed the available literature on the relationship between psychosocial barriers to exercise and physical activity level and frequency. A PubMed literature search for original articles published until January 2012 was carried out. Seventeen articles which met the predefined inclusion criteria were used in this review.

**Results:** Activity levels decreased during treatment but activity level pre-diagnosis is the best predictor for activity level post treatment. Breast cancer survivors who received an intervention showed less decline in physical activity levels during treatment. The most important psychosocial barriers to exercise were lack of time, lack of self-discipline, lack of social support, procrastination, no will power and loss of interest.

**Conclusion:** Every breast cancer survivor without a medical contraindication should be offered an intervention program in physical activity to cope and overcome psychosocial barriers to exercise. Continuing exercise in the presence of barriers does not seem to be possible at this point. Additional research is needed to clarify the most important barriers, the best interventions to decrease barriers and for possible ways to continue physical activity in the presence of physical as well as psychosocial barriers.

**Key words:** breast cancer, physical activity, exercise, (health-related) quality of life, barriers, intervention
Introduction

Breast cancer is the most diagnosed type of cancer in women, and the number of females diagnosed with this invasive disease is increasing. Cancer starts with an uncontrolled growth and mutation of cells in the breast, which causes a malignant tumor in this area. When this is left unchecked, malignant cells can spread to other parts of the body. Despite the increase in breast cancer cases, improvements in treatment and population screening have led to a concurrent decline in mortality rates over recent years. Therefore the number of breast cancer survivors is growing. I used the definition of the US National Coalition for Cancer Survivorship that defines a person as a survivor from the moment of diagnosis through the balance in his or her life. In the treatment of breast cancer there is a difference between curative treatment and palliative treatment: the first for patients that have a chance to be cured and the latter for patients that don’t have that chance anymore. The goals of those two treatments is different, and therefore we chose to focus on the first group only in this study. Due to the decline in mortality, a lot of women have to deal and live with the permanent effects of the disease. Consequently, research focused on improving quality of life and physical functioning in women with breast cancer [1].

Physical activity is a well-recognized quality-of-life intervention in breast cancer survivors [2]. Physical activity increases functional capacity and decreases side effects of treatment. Importantly, exercise after cancer diagnosis is associated with decreased mortality [3]. It enhances improvements in cardio respiratory fitness, immune function during recovery, self-esteem and other psychological health parameters in breast cancer patients and survivors [1]. In addition, although the effect of physical activity on cancer survival has not been identified for the largest part yet, it is suggested that physical activity improves prognosis due to beneficial effects on energy balance and cancer biomarkers, as well as reducing the risk of cardiovascular diseases as it is an important cause of death for many cancer survivors [3]. Furthermore, it was recently found that higher levels of physical activity were associated with reduced risks of death, breast cancer death, and breast cancer reoccurrence [4].

Despite the proven positive effects of exercise, estimates indicate that few cancer survivors meet physical activity guidelines [5] or are not active enough to reach the benefits of physical activity [6]. Other studies found that most breast-cancer survivors do not engage in regular physical
activity at all [7] or that only half of this population engages in regular exercise [8]. Also physical activity declines during treatment and in most cases does not return to pre-treatment levels, 62% reports reductions in activity level after diagnosis [7]. Adherence to exercise is an issue for healthy adults and seems to be even more difficult after a cancer diagnosis, with most difficulties during intensive and invasive medical treatment. The stresses of a cancer diagnosis and the well-known side effects of treatments partially account for these difficulties. Studies have reported adherence rates to supervised exercise interventions during treatment of approximately 70% and after treatment of 87-98% [9]. Adherence rates outside a supervised intervention are unknown.

The low rates of exercise adherence in breast cancer patients is, among others, due to barriers that exist in combination with exercise. Research suggests that “lack of time” is the main barrier [5-6]. Other barriers are no willpower, fatigue, fear [5], self-efficacy and low family social support [10] in survivors. During treatment barriers different barriers seem to be the main issue: breast pain in combination with bra discomfort (9) and feeling sick (12%), fatigue (11%), loss of interest (9%), vacation (7%), nausea/vomiting (5%). The most important barrier of women above sixty-five was inertia. For persons that do not engage in regular activity barriers are fear of falling, inertia, and negative affect. In the same group, persons that do exercise regularly report inertia, time constraints, and physical illness as being the most significant barriers. Persons in this age group that exercise regularly also report time constraints and physical illness as significant barriers, while the non-exercise condition reports fear of falling and negative affect as second and third most important barrier [11].

It is indicated by research that more than 50% of the barriers can be attributed directly to disease and treatment [1]. Further breast cancer patients have been found to perceive more barriers to exercise than age-matched controls [3]. About 39% of the patients feels that barriers interfere with physical activity interventions. The intention to engage in physical activity is probably inhibited by some or all of the barriers mentioned above. Because of this inhibition the intention to exercise will not be implemented. Barriers are therefore a mediator of exercise while, for example, ‘physical activity enjoyment’ is not [10]. It is most likely that a combination of the barriers mentioned above exists [1]. Given that barriers, correlates, and preferences vary by cancer type [7], this study is specially designed for breast cancer patients. Research also indicates that breast cancer treatment is a barrier on itself because of the invasive techniques, such as
chemotherapy, that are used [9]. This hypothesis is supported by another study [12] that found a significant difference in both perceived benefits and barriers to exercise between patients undergoing chemotherapy and patients after treatment.

Studies have been done that suggest research should focus on other factors than barriers, such as physical activity behavior, physical functioning, motivation and information provision [13]. Although it is acknowledged that desire for increased physical activity differs from the intention to do so, it is suggested that cancer patients are motivated to exercise [14]. This study will therefore start with the assumption that a focus on motivation, as suggested by study [13] is not necessary. According to the present study, three prominent themes account for patients behavior towards physical activity: values and beliefs about exercise, facilitators and barriers, and lack of inaccurate information about safe exercise [8]. Because the range of these three themes is very broad research should focus on one theme at a time, this study will only address the topic of facilitators and barriers. Findings suggest that attention to both emotional and psychosocial barriers to exercise may be warranted to further understand physical activity among breast cancer patients [3]. Because different solutions might exist to overcome psychosocial barriers (e.g. fear) and physical barriers (e.g. fatigue), only mental barriers were included in this study. It is also proposed that behavioral support programs need to focus on strategies to maintain exercise in the face of difficult barriers [9] and therefore the purpose of this study is to indicate factors that can help women with breast cancer to continue exercising in the presence of psychosocial barriers. It is hypothesized that reducing barriers to physical activity partially explains intervention effects.
Methods

Search strategy

A computerized search of the literature was carried out on 3 March 2012 by using the search engine PubMed. The search strategy combined the term ‘breast cancer’ with other key terms related to physical activity and physical activity barriers. Other key terms were motivation, information, fatigue, pain, quality of life, reoccurrence and information provision. For ‘physical activity’, the term ‘exercise’ was included as well. For ‘barriers’ the term ‘impediments’ was also included. The reference lists of all identified publications were checked to retrieve other relevant publications, which were not identified by means of computerized search. There were no restrictions with regard to the years of publication. The search yielded 3030 hits.

Selection criteria

Studies that met the following criteria were included: (i) if they evaluated which barriers exist in the presence of breast cancer; (ii) if they evaluated factors that can help people with cancer to continue exercising in the presence of barriers, and the evaluation was one of the key factors in the study; (iii) if the publication was an original article (no poster, abstract, letter to the editor, etc.); (iv) if the article was a full report published in English and (v) if it was published in a peer-reviewed journal. Studies were excluded for the following reasons: (i) if they were individual case reports; (ii) if the study was focused on adolescents, because their physical activity level might be influenced by different factors than those of adults; (iii) if the study was focused on palliative patients, because this patient group might have a different motivation for exercising or not exercising; (iv) if the term motivation was included in the title, because current research suggests that people are intrinsically motivated (as explained in the introduction); (v) if they evaluated cancers other than breast cancer. The described inclusion and exclusion criteria were applied to the initial 3030 hits. Based on their titles and abstracts, 27 studies met the criteria. The 27 hard copies were obtained and reviewed by one investigator. After careful review, 18 articles fulfilled the selection criteria and were included in this review. The flow chart of this selection procedure is shown in Figure 1.
Figure 1. Flow diagram of articles accepted and rejected during selection procedure. *The selection criteria are described in the methods section.
Results

Study characteristics
In total, 18 studies were included, all published between October 1991 and January 2012. Different questionnaires were used with different outcomes measures to assess physical activity barriers, physical activity benefits and physical activity motivation. Prospective, cross-sectional, longitudinal as well as intervention studies were used. The main findings are summarized in Table 1. In this review 18 studies were used. Five prospective studies, 4 longitudinal studies, 4 cross-sectional studies, 4 intervention studies and 1 qualitative study.

Physical activity levels and frequency
All studies found a general belief in breast cancer patients that physical activity is beneficial to them. Nine studies examined physical activity levels in breast cancer survivors [2-3, 5-9, 13-14]. Overall the different studies do not agree on the average activity level of breast cancer survivors. One intervention study claims that most breast cancer survivors do not engage in regular physical activity [7], another intervention study claims that engaging in exercise without enough social support is too much of a challenge for breast cancer survivors [9]. The only qualitative study found that half of the breast cancer survivors meet physical activity guidelines [8], a longitudinal study found that only a few meet the guidelines [5]. One cross-sectional study claims that breast cancer survivors activity level is too low to be beneficial [6]. A longitudinal study found the effect of social support on physical activity frequency is larger for older subjects (>40) than for younger ones(<40), this finding is confirmed by a prospective study focused on physical activity levels in older adults [11]. Mental health, barriers to exercise, and outcome expectancies significantly contribute to change in physical activity frequency. Two longitudinal studies found that activity level pre-diagnosis is the best predictor for activity level post treatment [2, 13]. Two cross-sectional studies confirmed this with the finding that activity levels decreased during treatment, but increased at least to pre-treatment levels after treatment [3, 14].
Barriers

Almost all included studies mentioned the theme physical activity barriers, seven of them mentioned which barriers to physical activity existed [1, 5-6, 8-9, 14-15]. Two cross-sectional studies concluded that fatigue (in 69% and 74% of the respondents respectively) was the most important barrier to engage in regular physical activity [14-15]. In 52% of the cases fatigue was affecting the whole body. About one-third felt most fatigued before physical activity. At the same time, physical activity in combination with periods of rest were the most commonly used strategies for symptom management [15]. Physical discomfort (45%) was the second most important barrier to physical activity. Seventy-eight percent of respondents claimed to exercise less than desired. Patients who claimed to be informed about the benefits of exercising were more likely to engage in exercise during treatment [14]. Another cross-sectional study in Malaysia concluded that lack of time was the most important barrier. This is because most breast cancer survivors are between the age of 40-50 and are juggling with household chores, childcare and/or job commitments [6]. According to a prospective study on bra discomfort, the most important barriers were, in order of importance: lack of self-discipline, procrastination, fatigued by physical activity, bra discomfort [1]. A longitudinal study focused on two other barriers as being the most important: too busy (52%) and no willpower (51%) [5]. It is clear that different studies point in different directions as it comes to the incidence of physical activity barriers, and the different studies also report big differences in the prevalence. An intervention study found the following barriers: feeling sick (12%), fatigue (11%), loss of interest (9%), vacation (7%), nausea/vomiting (5%). This study also found that barriers associated with disease and treatment accounted for 53% of all missed exercise sessions in the intervention. Demographic and medical variables did not predict the types of exercise barriers reported [9]. The qualitative study concluded that breast cancer survivors had the same barriers as the normal population: convenience, social support, time and musculoskeletal pain. Too much social support can be a barrier as well when family members are too concerned about the patient and start hospitalizing the patient. This study also found cancer specific barriers: fatigue, neuropathy, joint pain, poor body image, lymphedema that causes fear [8]. In contradiction, according to a prospective study by Nelson [12] there was a significant difference in both perceived benefits and barriers to exercise between a group of cancer patients and a control group.
One cross-sectional study focused on negative affect and the frequency of perceived barriers. Perceived barriers and cancer treatment probably have their effects on exercise behavior because they are associated with a common factor that is referred to as negative affect. According to this study fatigue and negative affect are not significantly associated with physical activity when controlled for age, employment, cancer stage, surgery type and receipt for adjuvant chemotherapy (these are all factors that interfere with physical activity behavior). Controlled for treatment and other cancer relevant and demographic variables, degree of negative affect and frequency of perceived barriers were significantly inversely associated with exercise [3]. This is the same conclusion as the qualitative study had. Also, two studies concluded that exercisers report less perceived barriers than non-exercisers [3, 11, 16].

**Intentions**
A prospective study indicated that attitude, subjective norm and perceived behavioral control explained 45% of variance in physical activity intention. Further, intention explained 30% of variance in physical activity behavior. Perceived behavioral control added no unique value [17]. An intervention study concluded that patients that are informed about the benefits of exercising are intrinsically motivated to participate in an intervention program [16].

**Interventions**
The three intervention studies included in this review all found that physical activity interventions in breast cancer survivors increased the activity level in their participants. In these studies, participants were randomly assigned to either an intervention condition or a control condition. Participants in the intervention group received physical activity training in groups, adjusted especially for their medical condition by a professional. Participants in the control condition received either a standard public health recommendation for physical activity or no exercise or recommendation for it at all. Finally, results in terms of engagement in physical activity were measured with observations and questionnaires at different points in time (e.g. four, eight or twelve week follow up) and differences between the two conditions were analyzed.
One study claims that physical activity decreases the risk of reoccurrence of the illness (35%) and decreases the mortality rate (46%) [7]. Subsequently another intervention study found that behavioral support programs should focus on maintenance of physical activity in the face of difficult side effects that come with cancer treatment [9]. An earlier intervention study by the same author already found that attitudes towards exercise and perception of control are higher in a group that participated in an intervention [16]. This study also found that physical activity should be promoted because it helps to lower stress levels, increases the functioning of the immune system and because it helps to motivate patients. It also concluded that survivors that engage in regular physical activity have little belief in the risk of reoccurrence of the illness. According to this study this attitude is right, so it is disconcerting that 40% of the survivors believe that physical activity reduces the risk of reoccurrence. This finding is contradictory to the finding in study [7] mentioned above. Another finding that is contradictory to many other studies mentioned in this review is that fatigue does not seem to be an excuse for not engaging in physical activity [16]. Other barriers (pain and family responsibilities) are consistent with findings mentioned above. The data also suggest that less effort is needed to convince breast cancer survivors of the beneficial effects of exercising, more attention should be paid to convincing them that it is enjoyable [16]. A longitudinal study concluded that breast cancer survivors who engaged in an intervention group had greater physical activity enjoyment [10]. Survivors that are informed about the benefits of physical activity, seem to be motivated enough to have the intention to exercise. Another important issue is that significant others (important persons in a patient’s social surrounding) approve of participation in an exercise program, which is consistent with the findings of the importance of social support mentioned in other studies. Summarized, this study concluded that breast cancer survivors had varied expectations of the benefits of exercise, varied levels of confidence in their ability to overcome exercise barriers, but uniformly positive expectations of support for exercise from others [16]. Finally, a longitudinal study concluded that interventions promoting physical activity maintenance should focus on optimizing physical activity behavior, psychosocial functioning and motivation [13].
<table>
<thead>
<tr>
<th>First author [reference], country, year</th>
<th>Design</th>
<th>Study Population</th>
<th>Instrument</th>
<th>Results</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gho [1], Australia, 2010</td>
<td>prospective</td>
<td>74 breast cancer patients</td>
<td>custom-designed questionnaire</td>
<td>Bra discomfort is the fourth highest barrier to exercise behind lack of self-discipline, procrastination, and fatigued by PA. A significant 70.3% of the sample reported experiencing bra discomfort during PA. The band was the most uncomfortable part of the bra for over half of the respondents. (57.7%)</td>
</tr>
<tr>
<td>Hsu [2], Taiwan, 2011</td>
<td>prospective, longitudinal and repeated measures</td>
<td>196 breast cancer survivors</td>
<td>various standarised instruments</td>
<td>PA level before illness is the best predictor for PA level afterwards. Effect of social support on PA frequency is larger for older subjects (&gt;40yr) than for younger ones. Mental health, PA barriers and PA outcome expectancy significantly contribute to change in PA frequency.</td>
</tr>
<tr>
<td>Perna [3], USA, 2008</td>
<td>cross-sectional</td>
<td>176 breast cancer patients</td>
<td>measuring exercise frequency and its association with negative affect and barriers to exercise, independent of cancer treatment.</td>
<td>Degree of negative affect and frequency of perceived barriers were significantly inversely associated with exercise, after accounting for cancer-relevant and control variables.</td>
</tr>
<tr>
<td>Reference</td>
<td>Study Design</td>
<td>Sample Size</td>
<td>Sample Characteristics</td>
<td>Intervention/Findings</td>
</tr>
<tr>
<td>-----------</td>
<td>--------------</td>
<td>-------------</td>
<td>------------------------</td>
<td>-----------------------</td>
</tr>
<tr>
<td>Vallance, [4], Canada, 2008</td>
<td>Longitudinal</td>
<td>377 breast cancer survivors</td>
<td>Patients receiving standard public health recommendation for PA, a step pedometer alone, or one of two theory of planned behavior (TPB) change interventions.</td>
<td>Compared to the SR group, the INT group reported more favorable changes in instrumental attitude, intention, and planning.</td>
</tr>
<tr>
<td>Ottenbacher [5], USA, 2011</td>
<td>Cross-sectional and longitudinal</td>
<td>452 breast and prostate cancer survivors</td>
<td>Home based behavioral interventions (fresh start trial)</td>
<td>PA barriers were: too busy (52%), no willpower (51%). Survivors who reported 'no willpower' also reported 18.7 fewer minutes of PA compared to those not reporting this barrier.</td>
</tr>
<tr>
<td>Loh [6], Malaysia, 2011</td>
<td>Cross-sectional</td>
<td>51 breast cancer patients/survivors</td>
<td>Pre-post questionnaire and a media-clip as a cancer control strategy. Structured questionnaires to collect sociomedical demographic and PA data.</td>
<td>Significant relationship between level of PA before and after diagnosis. Majority of survivors in this study were not found to be physically active and did not even consciously think of participating. Lack of time is the main barrier amongst those survivors who are mostly between 40-50 years old and juggling with household chores, childcare and/or job commitments.</td>
</tr>
<tr>
<td>Rogers [7], USA, 2011</td>
<td>Longitudinal</td>
<td>41 breast cancer survivors</td>
<td>3-month intervention or usual care, examined mediation by social cognitive theory constructs. Freedman &amp; Schatzkin method</td>
<td>Intervention group reported lower barrier interference than the usual care group, and greater PA enjoyment. 39% of the intervention effect (3 months postintervention) was mediated by barrier interference. PA enjoyment was not a significant mediator.</td>
</tr>
<tr>
<td>Study</td>
<td>Country</td>
<td>Year</td>
<td>Design</td>
<td>Sample Size</td>
</tr>
<tr>
<td>-------</td>
<td>---------</td>
<td>------</td>
<td>--------</td>
<td>-------------</td>
</tr>
<tr>
<td>Sander [8], USA, 2012</td>
<td>grounded theory qualitative study (qualitative data were triangulated with data from 2 quantitative scales)</td>
<td>34 breast cancer survivors</td>
<td>semistructured interviews that were recorded, transcribed, coded. Also use of Decisional Balance Scale and the Rapid Assessment of PA.</td>
<td>A general belief exists about the benefits of PA. PA levels decreased during treatment but increased beyond prediagnosis levels afterwards. Three prominent themes described behavior regarding PA: values and beliefs about PA, facilitators and barriers that were both similar to those affecting the general population and cancer specific, and lack of inaccurate information about safe exercise.</td>
</tr>
<tr>
<td>Courneya [9], Canada, 2008</td>
<td>controlled trial</td>
<td>242 breast cancer patients initiating adjuvant chemotherapy</td>
<td>random assignment to usual care group, supervised resistance group or anerobic exercise group. Plus questionnaires</td>
<td>Participants were asked to provide a reason for each missed exercise session. The 2090 reasons accounted for 36 different barriers. Feeling sick (12%), fatigue (11%), loss of interest (9%), vacation (7%), and nausea/vomiting (5%) were the most common. Disease/treatment related barriers accounted for 53% of all missed exercise sessions. Demographic and medical variables did not predict the types of exercise barriers reported.</td>
</tr>
<tr>
<td>Rogers [10], USA, 2012</td>
<td>prospective, randomized controlled trial</td>
<td>256 breast cancer survivors</td>
<td>HADS, SF-36, FACT-B, WOMAC, BEAT-cancer intervention, interdisciplinary approach</td>
<td>Physical activity programs should be offered to all breast cancer survivors without a medical contraindication given the association between PA and a reduction of the risk for breast cancer reoccurrence and the mortality of 35% and 46% respectively.</td>
</tr>
<tr>
<td>Study</td>
<td>Design</td>
<td>Sample Size</td>
<td>Sample Characteristics</td>
<td>Findings</td>
</tr>
<tr>
<td>------------------------------</td>
<td>------------</td>
<td>---------------</td>
<td>----------------------------------------------------------------------------------------</td>
<td>--------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Lees [11], USA, 2005</td>
<td>Prospective</td>
<td>66 older adults</td>
<td>Six focus groups, three with exercisers and three with non-exercisers were conducted at various sites throughout Rhode Island.</td>
<td>13 barriers to PA behavior. Most significant mentioned by nonexercisers: fear of falling, inertia and negative affect. Exercisers identified inertia, time constraints, and physical ailments as being the most significant barriers.</td>
</tr>
<tr>
<td>Nelson [12], USA, 1991</td>
<td>Prospective</td>
<td>55 stage-1 breast cancer survivors who have not received adjuvant therapy</td>
<td>Breast cancer survivors were matched to a cohort of women in the community who had not experienced cancer. Custom-designed questionnaires were done to investigate the perceived benefits and barriers to PA between groups.</td>
<td>No significant differences were found in perceived health, self-esteem and health habits between women who had experienced breast cancer and the matched cohorts. There was a significant difference in both perceived benefits and barriers to exercise between groups, with the matched cohorts scoring higher on perceived benefits and barriers to exercise.</td>
</tr>
<tr>
<td>Vallance [13], Canada, 2010</td>
<td>Longitudinal</td>
<td>377 breast cancer survivors</td>
<td>Data were collected on: demographic, medical, psychosocial, motivational and behavioral variables. Assessments.</td>
<td>Survivors meeting PA guidelines at baseline and postintervention had a greater likelihood of meeting PA guidelines at 6 months follow up. (Interventions promoting PA maintenance should focus on optimizing PA behavior, psychosocial functioning, and motivation. Overall belief that PA is beneficial. Significant decline in PA from pre-illness to the time in active treatment. 78% claimed to exercise less than desired. Barriers included fatigue (74%) and physical discomfort (45%). Patients who claimed to have been informed about exercise were more in agreement with being able to exercise during treatment.</td>
</tr>
<tr>
<td>Midtgaard [14], Denmark, 2009</td>
<td>Cross-sectional</td>
<td>451 cancer patients</td>
<td>Questionnaire assessing pre-illness and present PA, motivation and information perceived</td>
<td>Questionnaire assessing pre-illness and present PA, motivation and information perceived</td>
</tr>
<tr>
<td>Study</td>
<td>Year</td>
<td>Design</td>
<td>Sample Size</td>
<td>Methodology</td>
</tr>
<tr>
<td>-------</td>
<td>------</td>
<td>--------</td>
<td>-------------</td>
<td>-------------</td>
</tr>
<tr>
<td>Schwartz [15], USA, 1998</td>
<td>cross-sectional</td>
<td>219 cancer survivors</td>
<td>investigator-developed mailed survey</td>
<td>Most patients were physically before as well as after diagnosis and continued to exercise (with modification) during treatment. 69% of respondents experienced problems with cancer-related fatigue (CRF) during treatment, with 52% describing their CRF as affecting whole body. Although 26% felt most fatigued before PA, PA and rest were most commonly used strategies for symptom management. Significant variability in the expected benefits of exercise prerandomization, ranging from 40% for a reduced risk of breast cancer recurrence to 94% for an improved energy level. Moreover, attitudes toward exercise and perceptions of control were higher in the exercise group after the exercise program. Regression analyses indicated that attitude, subjective norm and perceived behavioral control explained 45% of the variance in PA intention, with each factor uniquely contributing to intention. Furthermore, exercise intention explained 30% of the variance in physical activity behavior; however, perceived behavioral control added no unique value.</td>
</tr>
<tr>
<td>Courneya[16], Canada, 2006</td>
<td>prospective, randomized controlled trial</td>
<td>52 early stage breast cancer survivors</td>
<td>intervention trial and control group. Measures in accordance to the guidelines presented by Ajzen (2001)</td>
<td></td>
</tr>
<tr>
<td>Blanchard, [17], USA, 2002</td>
<td>prospective</td>
<td>83 breast cancer survivors</td>
<td>mailed self-administered questionnaire that assessed PA behavior during the previous week, demographic and medical variables, and the theory of planned behavior.</td>
<td></td>
</tr>
</tbody>
</table>
Discussion

The goal of this study was to review, summarize and evaluate the results of all studies focusing on factors that can help women with breast cancer to continue exercising in the presence of barriers. Two studies that measured physical activity levels before and after treatment concluded that physical activity level before treatment was the best predictor for physical activity level after treatment. In both studies physical activity level decreased significantly after diagnosis and during treatment [2, 13]. A general belief exists among breast cancer survivors that physical activity is beneficial and that it should be part of symptom management [8, 14]. This is a positive finding given the association between physical activity and a reduction for the risk for breast cancer reoccurrence and the decreased mortality [7] Therefore, public health messages have to continue emphasizing consistently that short exercise routines or some exercise are better than no exercise at all [6].

Behavioral support programs are needed to help breast cancer patients focus on strategies to maintain physical activity despite difficult treatment side effects [9]. Survivors who were engaged in physical activity were not afraid to exercise. However, concern about lymphedema and knowledge about safe and effective exercise programs influenced choices survivors made concerning physical activity engagement [8]. This stresses the importance of information provision by doctors regarding physical activity [16]. In the four intervention studies included in this study, it was concluded that intervention in the form of exercise programs significantly changes physical activity levels in a positive direction [5, 7, 9, 16]. Also, the intervention increased the attitude towards physical activity and perception of control is higher in patients who took part in an intervention program [16]. Reducing barriers partially explains this intervention effect [10, 16]. According to a study by Vallance [13] interventions promoting physical activity should focus on optimizing physical activity behavior, psychological functioning and motivation. In another study by the same author mediation analyses indicated that both planning and intention partially mediated the effects of intervention on physical activity. Also, the theory of planned behavior intervention resulted in small improvements in the constructs of planning and motivation that partially mediated effects on the intervention of physical activity behavior [4]. The same result was found in a prospective study by Blanchard [17] who suggested that nurses should use the theory of planned behavior as a model for understanding factors that influence
physical activity intentions and behavior in breast cancer survivors. Knowledge of barriers associated with physical activity may be helpful in designing optimally targeted exercise program interventions among breast cancer survivors [5].

According to the present study the psychosocial barriers mentioned in the result section can be undermined by using an intervention program that is designed to improve willpower, interest and self-discipline through means of adequate information provision and professional support. The barrier ‘lack of social support’ will decrease without further effort because breast cancer survivors will exercise in a group so they gain social support by their peers. Because all participants have the same diagnosis and receive surgery as primary treatment, they have to worry less about their body image. Also, their body image will get better due to the positive effects of sports. The barriers ‘lack of time’ and ‘procrastination’ can be decreased by drawing attention towards information provision on the benefits of physical activity. When patients understand the importance of physical activity after a breast cancer diagnosis, they are more likely to plan time to engage in physical activity. Because survivors participate in an exercise program they already experience peer pressure, which decreases the frequency of excuses to skip the training. Therefore the most important recommendation in this study is that every breast cancer survivor without a medical contraindication should be offered an intervention program in physical activity [7]. This finding is consistent with the expectation that a positive and significant effect of intervention studies on physical activity behavior exists. However, it was not expected that the only way to increase the level of physical activity in breast cancer survivors was to decrease barriers. The aim of this study was to find factors that could help breast cancer survivors to continue exercise in the presence of barriers. This study suggests that a good way to increase activity levels is by decreasing barriers first. Apparently barriers have too much influence on activity levels to be overruled by other solutions for increasing exercise.

Although there is a clear consensus on the most important barriers throughout the different studies, there are some differences. First, one cross-sectional study [5] mentions ‘no willpower’ as the second most important barrier to engage in physical activity. Contradictory, another cross-sectional study [14] concludes that breast cancer survivors are intrinsically motivated to engage in physical activity. This difference might be explained by the fact that the second cross-sectional study focused on motivation to exercise in combination with information provision by doctors.
The first cross-sectional study focused on exercising in breast cancer patients and their barriers in special. Therefore it might be too soon to jump to conclusions about discrepancies in results of the various studies on the most important barriers and the differences between their conclusions should not be torn from its context. For instance, in the intervention studies different trials are used to advance physical activity levels and therefore participants might experience different barriers to different interventions. It is important, however, that intentions of breast cancer survivors to engage in physical activity are monitored closely to prevent that intervention programs focus on the wrong issues. Secondly, researchers should be clearer on differences in barriers to physical activity prediagnosis, post diagnosis, pretreatment and post treatment. According to one of the intervention studies [9] disease and treatment related barriers accounted for over half of all missed exercise sessions. This indicates that treatment might be mentioned as a barrier on itself in future research. Organizing barriers into different categories, according to the phase of the illness and treatment, might help to clarify the relationship with physical activity. Also, it might help researches to set up specialized intervention programs by taking the phase of the illness and treatment into account.

Additional research is needed to clarify the most important barriers, the best interventions to decrease barriers and for possible ways to continue physical activity in the presence of physical as well as psychosocial barriers. It was the aim of this study to find possibilities to continue physical activity in the presence of barriers, but provisional results indicate that barriers have too much influence on physical activity level to overcome them. Continue exercising in the presence of barriers might not be the right term, research should focus on reducing the interactions of barriers with physical activity. Excluding a variable that is so important to the matter of physical activity in breast cancer patients can’t be justified. Besides that, research should focus on strategies to organize intervention programs for breast cancer survivors. That might bring science one step closer to a higher quality of life in breast cancer survivors since physical activity has great benefits for breast cancer survivors and it leads to less reoccurrence of the illness and even a decreased mortality.
References


