

# Barriers to physical activity in women with and without breast cancer

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## ABSTRACT

**Introduction:** Regular physical activity (PA) is important for the entire population, equally for healthy people and survivors of breast cancer. Despite the benefits of PA, there are women who do not attain the recommendation from the World Health Organization (WHO). **Objective:** To describe and compare the barriers to PA in women with and without breast cancer. **Methods:** A cross-sectional descriptive study was performed. The consisted of 230 women with primary breast cancer diagnosed up to one year and 231 women without breast cancer. Both groups were matched by age ( $\pm 5$  years). The participants answered a questionnaire with questions about barriers to PA and sociodemographic, anthropometric and behavioral characteristics. **Results:** Women with breast cancer perceived more barriers to PA than those without diagnosis (59.4% versus 40.7%). The barriers most cited by women diagnosed with breast cancer were “feeling discomfort or pain” (59.6%) and “feeling tired” (56.1%). The barriers most mentioned by women without diagnosis were “lack of money” (21.6%) and “lack of company” (19.1%). **Conclusion:** Women with breast cancer report more barriers than women without the disease. Therefore, it is suggested that they have a lower level of PA in leisure time. The perceived barriers to PA among women with and without breast cancer are similar, but they differ in the physical barriers.

**Keywords:** women’s health; epidemiologic measurements; barriers to access of health services; motor activity.

## INTRODUCTION

Regular physical activity (PA) is important for the entire population, including both healthy patients and breast cancer survivors. In healthy people, PA is associated with reductions in chronic non-communicable diseases, such as cardiovascular disease, cancer and type 2 diabetes<sup>1</sup>. Among breast cancer survivors, there is an association between PA and lower risks of disease recurrence, cancer mortality, and overall mortality, in addition, PA can reduce the side effects of treatment on cardiovascular, pulmonary, endocrine, immune, musculoskeletal, neurological and lymphatic systems and psychological disorders like anxiety and depression<sup>2,3</sup>. Thus, encouraging the engagement in regular PA is extremely relevant.

Despite the benefits of PA in healthy people and cancer survivors, many women do not follow the World Health Organization (WHO) recommendation, which suggests the performance of aerobic exercise at least three times a week for 30 minutes, resistance

How to cite this article: Gomes *et al.* Barriers to physical activity in women with and without breast cancer. ABCS Health Sci. 2020;45:e020022. <https://doi.org/10.7322/abcshs.45.2020.1404>

Received: Dec 16, 2019

Revised: Apr 13, 2020

Approved: May 12, 2020

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Declaration of interests: nothing to declare



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exercises two to three times a week and flexibility exercises three times a week lasting between 50 and 60 minutes. Globally, at least 27% of the women do not reach the recommended levels of PA<sup>1</sup>.

Several factors may be associated with the low prevalence of PA. Environmental factors related to urbanization, such as fear of violence and crime in outdoor spaces, intense traffic, poor air quality and pollution, lack of parks and sports or recreational facilities. Social factors should also be emphasized such as those leading women to take greater responsibility in their homes, the cost of access to some types of PA and lack of information on how to exercise. Moreover, cultural factors that restrict women to practice some sports and psychological factors such as lack of motivation, ability, company, discipline and interest, fear, disliking PA and depression may be associated with the low prevalence of PA in women<sup>4</sup>. There are some disease-related barriers in women who are breast cancer survivors, and the main barriers cited by the patients are related to physical factors such as nausea, pain, fatigue and psychological factors such as depression<sup>5,6</sup>.

Understanding the barriers to PA is a crucial step in the development and implementation of effective interventions that promote the practice of PA in both healthy women and breast cancer survivors. In addition, it is important to verify whether the barriers observed by breast cancer survivors are exclusively associated with the disease or if they are like those observed in healthy women. The hypothesis of this study was that women without breast cancer diagnosis would report fewer barriers than women with the diagnosis.

Thus, the objective of the present study was to describe and to compare the barriers to PA in women with and without diagnosis of breast cancer.

## METHODS

A cross-sectional descriptive study was carried out to verify the barriers to PA in women with and without breast cancer. This study was based on the STROBE reporting guide to improve the quality, reproducibility and understanding of the manuscript<sup>7</sup>. The sample was obtained from a case-control study about PA and breast cancer.

Pre and post-menopausal women with primary breast cancer diagnosed up to one year (incident cases) and women without breast cancer participated in the study. Women with breast cancer (cases) were recruited from four oncological centers (public and private) in the city of Pelotas, located in southern Brazil. The women were identified through the medical records of health services and home-based interviews were scheduled. Women without breast cancer (controls) were selected based on their home address (nearby the cases' houses). The women were matched by age ( $\pm 5$  years) and were recruited between November 2016 and June 2017. The sample size estimation considered the following parameters: confidence level at 5%; statistical power of 80%; case/control ratio 1:1; exposure

among cases 20%; exposure among controls 40% and an odds ratio of 0.8, resulting in a sample size of 230 women with breast cancer and 231 women without the disease.

Women were asked about barriers to PA and socio-demographic characteristics such as age, skin color, schooling, marital and socioeconomic status, anthropometric (height and body mass), and behavioral characteristics (alcohol consumption, smoking and lifetime leisure-time PA).

Alcohol consumption and smoking were measured using two closed questions (yes/no). Lifetime leisure-time PA was measured using the questionnaire proposed by Friedenreich *et al.*<sup>8</sup>, called "The lifetime total physical activity questionnaire". This questionnaire involves four domains of PA, considering household, occupational, commuting and leisure activities carried out throughout life. Also, it measures frequency, duration and intensity of activities in each domain through seven questions in the leisure and household domains, and 12 questions in the occupational domain, which also measures traveling from and to work (commuting domain), but the authors used only data from the leisure domain for the present study. The instrument provides PA quantification in metabolic equivalent (MET), the values used were taken from the Compendium of Physical Activities. A MET is defined as the ratio between the metabolic rate associated with a specific activity compared to the resting metabolic rate<sup>8</sup>. To estimate the energy expenditure in each activity, the METs value is multiplied by the length that the activity was performed<sup>8</sup>. Barriers to PA were evaluated through nine closed (yes/no) questions and one open question. The questionnaire investigated environmental factors, such as being fearful of going outside or not having an adequate place/facility for the practice of PA in the neighborhood; social factors such as lack of money, lack of information on how to exercise and lack of time; physical factors such as feeling discomfort or pain and feeling tired; and psychological factors such as lack of company, and disliking PA. The open question referred to any barrier that was not contemplated in the closed questions.

Data analysis included the calculation of the prevalence of perceived barriers to PA in both groups and chi-square tests were used to test the associations between the main exposures (socio-demographic, behavioral and anthropometric characteristics) and the barriers to PA.

All the barriers were combined, a dichotomous (yes/no) variable was generated and the absence of barriers was coded as zero (negative – no barriers) whereas one or more barriers were coded as one (positive – presence of barriers). The statistical package Stata 14.0 was used for statistical analyses.

The Research Ethics Committee of the School of Physical Education of the Federal University of Pelotas approved the design of this study under the number 50752115.4.0000.5313. A written informed consent was obtained from each subject before starting the study.

## RESULTS

During the study period, 271 women with diagnosis of breast cancer were initially identified as potentially eligible, 41 were excluded because they did not want to participate in the study (n=12), because they did not live in the city where the study was conducted (n=21) and because they died (n=8). The women without breast cancer should not present the diagnosis of any type of cancer and 621 women were initially identified as potentially eligible, of which 390 refused to participate in the study and the main reason was lack of time to answer the questionnaire (n=302). The study was composed by 230 women with the diagnosis of breast cancer and 231 without diagnosis. Figure 1 shows the flowchart of the participants throughout the study.

The mean age of the sample was 60 years ( $\pm 13.0$ ), most of the women were white (83.3%) and married (69.3%). The mean schooling of the sample was 9.7 years ( $\pm 4.9$ ). Most of the women had never smoked (76.5%) and 56.6% of the sample reported current or past habit of drinking alcohol. Based on the body mass index (BMI), 46.8% of women were considered overweight (Table 1).

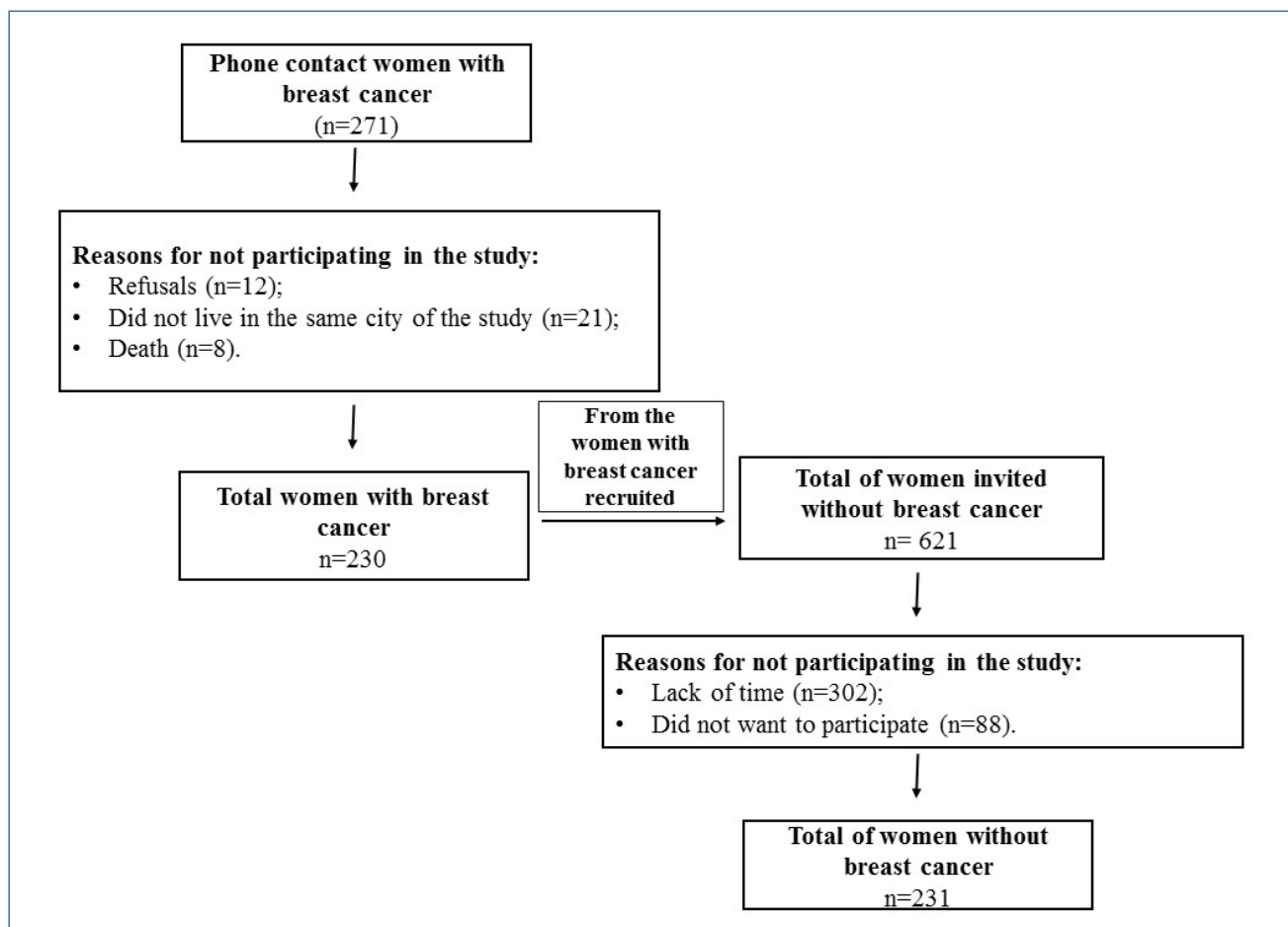
Regarding barriers to PA (Table 2), the comparison between women with and without breast cancer reveals that women without breast cancer reported fewer barriers (59.4% *versus* 40.7%,  $p < 0.001$ ).

The barriers “feeling discomfort or pain” and “feeling tired” were cited by both groups, 59.6% and 15.6% ( $p < 0.001$ ), 56.1% and 16.0% ( $p < 0.001$ ), respectively.

The barrier “feeling fearful or dangerous for lack of safety” was cited by 28.3% of the women diagnosed with breast cancer and 16% of the women without cancer ( $p = 0.002$ ) and “not having PA facilities in the neighborhood” was mentioned by 20.9% and 6.1% ( $p < 0.001$ ), respectively.

“Lack of information on how to exercise” was a barrier mentioned by 22.6% of the diagnosed women and 10.8% of the women without the diagnosis ( $p = 0.001$ ), “lack of money” was cited by 33.5% and 21.6% of the women ( $p = 0.004$ ), respectively. Although “lack of time”, was reported as a barrier to PA by 15.6% of the women with breast cancer and 11.7% of those without the diagnosis, no significant differences were observed between the groups ( $p = 0.22$ ).

The barrier “lack of company to practice PA” was cited by 40.0% of the women diagnosed with breast cancer and 19.1% of the



**Figure 1:** Flowchart of study participants.

women without ( $p < 0.001$ ). “Disliking PA” was cited by 16.1% of the women diagnosed with the disease and 11.3% of the women without diagnosis ( $p = 0.13$ ), with no difference between groups.

Another barrier that was not mentioned in the closed questions was cited by 7.4% of the women diagnosed and 1.7% of the women without diagnosis ( $p = 0.004$ ). Other barriers reported by the women with breast cancer were nausea (59%), physical appearance (29%) and the disease itself (12%), on the other hand, women without cancer reported “bad weather” (25%) and “unwillingness” (75%).

**Table 1:** Description of the sample characteristics, Pelotas, 2018. N=461.

Characteristics	Women with breast cancer (%)	Women without breast cancer (%)	Total sample (%)	p
<b>Age (years)</b>				
24-44	47.4	52.6	12.4	0.91
45-65	50.7	49.3	51.0	
>66	50.3	49.7	36.6	
<b>Skin color</b>				
White	49.7	50.3	83.3	0.91
Black	49.0	51.0	11.1	
Others	53.9	46.2	5.6	
<b>Marital Status</b>				
Married	48.1	51.9	69.3	0.51
Single	60.6	39.4	7.2	
Divorced	52.0	48.0	10.9	
Widowed	43.5	46.5	12.6	
<b>Education (years)</b>				
0-8	51.4	48.6	55.8	0.30
9-11	41.2	58.8	14.7	
>12	51.5	48.5	29.5	
<b>Socioeconomic quartiles</b>				
First (poorest)	56.2	43.8	25.1	0.21
Second	43.0	57.0	25.1	
Third	47.9	52.1	25.7	
Fourth (wealthiest)	52.8	47.2	24.1	
<b>Smoking history</b>				
Current smoker	55.0	45.0	8.7	0.001
Never smoked	45.5	54.5	76.5	
Former smoker	69.1	30.9	14.8	
<b>Alcohol consumption</b>				
Yes	55.2	44.8	43.4	0.01
No	43.0	57.0	56.6	
<b>Body Mass Index (BMI)</b>				
Normal weight	57.5	42.5	18.9	0.006
Overweight	41.9	58.1	46.7	
Obese	56.3	43.7	34.4	
<b>Leisure-time PA (quartiles)</b>				
First (least active)	58.2	41.8	34.2	<0.001
Second	64.4	35.6	15.9	
Third	41.9	58.1	25.4	
Fourth (most active)	37.2	62.8	24.5	
<b>Barriers</b>				
Yes	59.4	40.7	50.0	<0.001
No	24.4	75.6	50.0	

When all barriers were grouped comparing women with and without breast cancer diagnosis, women older than 66 presented more barriers than the younger women (OR=4.73; 95%CI 1.48-15.1,  $p = 0.02$ ). Women with schooling over 12 years in both groups (women with breast cancer OR=0.37; 95%CI 0.16-0.84,  $p = 0.01$  and women without breast cancer OR=0.14; 95%CI 0.07-0.27,  $p < 0.001$ ) had fewer perceived barriers to PA when compared to women with lower schooling. Regarding socioeconomic level, women with and without diagnosis in the 4th quartile presented fewer barriers compared to the women with lower socioeconomic level (OR=0.26, 95%CI 0.08-0.84,  $p = 0.01$  and OR=0.34, 95%CI 0.15-0.78,  $p = 0.03$ , respectively). Obese women were more likely to perceive barriers compared to overweight and eutrophic women (OR=2.78; 95%CI 1.21-6.59,  $p = 0.09$ ), but only for the women without diagnosis of breast cancer. The variables skin color, marital status, smoking history, alcohol consumption and lifetime PA were not associated with the outcome in both groups.

**Table 2:** Description of the barriers perceived by women with and without diagnosis of breast cancer. Pelotas, 2018. N=461.

Barriers	Women with breast cancer (%)	Women without breast cancer (%)	p
<b>Feeling fearful or finding it dangerous</b>			
No	71.7	84.0	0.002
Yes	28.3	16.0	
<b>Feeling discomfort or pain</b>			
No	40.4	84.4	<0.001
Yes	59.6	15.6	
<b>Feeling tired</b>			
No	43.9	84.0	<0.001
Yes	56.1	16.0	
<b>Lack of information</b>			
No	77.4	89.2	0.001
Yes	22.6	10.8	
<b>Lack of time</b>			
No	84.4	88.3	0.215
Yes	15.6	11.7	
<b>Lack of money</b>			
No	66.5	78.4	0.004
Yes	33.5	21.6	
<b>Lack of adequate facilities</b>			
No	79.1	93.9	<0.001
Yes	20.9	6.1	
<b>Lack of company</b>			
No	60.0	80.9	<0.001
Yes	40.0	19.1	
<b>Disliking PA</b>			
No	83.9	88.7	0.131
Yes	16.1	11.3	
<b>Other barriers</b>			
No	92.6	98.3	0.004
Yes	7.4	1.7	

## DISCUSSION

Encouraging physically active women to stay physically active is an important public health priority given the physical and psychosocial health benefits of sustained PA for this population. The purpose of our study was to help increase knowledge regarding the perceived barriers to maintaining a PA program in women with and without diagnosis of breast cancer. We have provided an account of the perceived factors that enable or act as barriers to women's continued PA participation. Our study suggests that women diagnosed with breast cancer perceive more barriers than the women without this diagnosis. Women with breast cancer consider barriers not only related to the disease, such as nausea, discomfort or pain, fatigue and appearance, but also those related to social and environmental factors.

The findings herein confirm that there are multiple factors that make it difficult for women to maintain an active behavior. These factors can be divided into physical, psychological, environmental and social factors.

Barriers related to physical factors were cited in the present study by both women affected with breast cancer and women without diagnosis. However, women with breast cancer cited more barriers than healthy women. The literature reports that the physical barriers for the women diagnosed are related to the side effects of treatment, such as fatigue, neuropathy, pain, not feeling well with their body image, weakness and nausea being the most cited ones<sup>5,9-16</sup>. Those mentioned by the women without cancer seem to be related to the aging process, to the presence of other chronic diseases (not cancer), and to the fear of falls or injuries<sup>17-21</sup>. The difference between both groups is that healthy women may not experience these physical barriers mentioned above, but all women diagnosed with breast cancer suffer from the side effects of treatment, increasing their probability of reporting these physical barriers. The physical barriers participants described add new evidence of cancer context-specific barriers to exercise participation. As patients grow older, the likelihood of survival after diagnosis reduces and likelihood of reoccurrence increases; therefore, maintaining a physically fit body is important to breast cancer survivors. Increasing age and a high BMI can be a negative influence on promoting physically active behaviors in older women. Engaging in exercise has been found to reduce fatigue as well as cause significant improvements in BMI, body weight and physiological output. Some researchers have posited that exercise may increase survival rates however being overweight at the time of diagnosis and weight gain after diagnosis have been linked to poorer survival. Thus, control of weight gain is an important element of cancer survivorship<sup>5,9-16</sup>.

The most reported psychological factors were lack of motivation, lack of company, fear and disliking PA, and these results are in accordance with previous studies evaluating the barriers to practice PA<sup>5,9-12,14-16,20-30</sup>. The impact of these findings has

several implications on the current understanding of barriers to long-term exercise participation. For example, the observed lack of motivation reported here has been found to be one of the psychological barriers to exercise participation, and these results further support the need to address this apathy within lifestyle programs. In addition, these findings add to the growing research on understanding fear barriers to exercise participation, such as a lack of accurate and tailored information (safety in structured programs). These participants' dislike of the gym could be linked to a lack of environmental mastery as individuals who perceive the gym as an uncomfortable and unwelcoming space report feeling threatened and out of their comfort zone, thereby reducing the ability to experience positive emotions even in group exercise<sup>9-12</sup>. Furthermore, the perception of 'not being the sporty type' is rife among women, with research showing reduced activity participation in women in relation to their male peers. However, explanations as to why this occurs vary from psycho-social (self-presentation) to more environmental/biological (parental) influences. Physical education programs should aim to clarify that exercise participation does not need to be of vigorous intensity, as walking and moderate intensity exercise have comparable benefits to intense activity (e.g. positive effects on cardiovascular disease and diabetes)<sup>20-30</sup>.

Our study observed that the environmental factors influenced more the behavior of the women affected by breast cancer in comparison to the women without the diagnosis. Most of the environmental factors mentioned in previous studies are the difficulty in accessing the public transport, the lack of an adequate facility in the neighborhood, climate, traffic, overwork and lack of safety, in which the current study also reported similar barriers to practice PA<sup>5,6-9,11-14,16,19,20,25,26,28,31,32</sup>. The same occurred with the social factors, that affected the behavior of the diagnosed women more than the women without diagnosis. The most mentioned barriers to PA related to the social factors in previous studies are the lack of money, lack of knowledge, lack of time and the absence of free programs aiming to promote PA, corroborating the results of our study<sup>10,12-14,16,17,19,23-27,29,30,32,33</sup>. These findings regarding women's perceived barriers recognize that multiple reasons can inhibit regular PA engagement, and some of these factors are related to the socioeconomic status of these women.

Our results provide important information about the comparison of perceived barriers to practice PA between women with and without breast cancer. However, some limitations should be discussed. These data are cross-sectional and do not imply any causal inference, besides we are aware that the instrument used to measure PA was based on a lifetime recall period, whereas the barriers reported are more contemporary, but the main purpose of the study was to describe barriers and their differences between women with and without a chronic condition. Also, although the PA instrument included four domains,



all the barriers were mostly linked to leisure activities because the other domains are usually not optional and, therefore, were not mentioned in the literature.

In summary, the results of the present study showed that women with breast cancer report more barriers than women without the disease, and it is therefore suggested that they have a lower level of PA leisure time. The perceived barriers to PA among women with and without breast cancer are similar, and they differ in the physical barriers. Women diagnosed with breast cancer tend to cite more barriers due to the adverse effects of the treatment, as most of the women are affected by them. On the other hand, women without the diagnosis may not perceive the barriers related to physical factors such as the aging process, the presence of other chronic diseases, fear of falls or injury, and for this reason, they did not cite it.

Strategies to promote and maintain an active lifestyle among women with and without breast cancer should include improving environmental and financial access to PA opportunities as well as raising awareness of their health benefits through public policies. These strategies can increase their confidence and motivation to engage in PA and encourage them to meet current WHO recommendations.

### Public Health implications

Understanding the barriers to PA is a crucial step in the development and implementation of effective interventions that promote the practice of PA in both healthy women and breast cancer survivors. In addition, it is important to verify whether the barriers observed by breast cancer survivors are exclusively associated with the disease or if they are like those observed in healthy women.

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