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Nutritional Profile and Physical Activity in Women with Breast Cancer Attended by the Unified Health System in South Brazil

Perfil Nutricional e Atividade Física em Mulheres com Câncer de Mama Atendidas pelo Sistema Único de Saúde no Sul do Brasil

Perfil Nutricional y Actividad Física en Mujeres con Cáncer de Mama Tratadas por el Sistema Único de Salud en el Sur de Brasil

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Abstract

Introduction: Nutritional status and physical activity are modifiable factors for risk and prognostic of breast cancer. Knowing these parameters in different locations is important because it allows setting priorities and allocating resources toward a positive change. **Objective:** To evaluate for the first time the nutritional status and physical activity level in women undergoing treatment for breast cancer in a reference center in Pelotas (RS/Brazil). **Method:** Cross-sectional study. Were evaluated patients above 20 years old, treated by the Unified Health System, between June and November 2012 using the body mass index, waist circumference, International Physical Activity Questionnaire, body weight variation and questions about previous nutritional counseling. **Results:** Among the 72 women evaluated, 70% presented excess of body weight and 87.5% had high waist circumference, with an average of 92.1±14.7 cm (95% CI: 88.6; 95.6). Physical inactivity was associated with weight gain (p=0.03) and was prevalent in 94.4% of the subjects. Approximately 65% of women undergoing adjuvant treatment increased weight, with a significant difference when compared to other types of treatment (p=0.03). Only four women reported having received previous nutritional counseling. **Conclusion:** The majority of the evaluated women presented overweight, sedentary habits, abdominal obesity and absent of nutritional counseling at the beginning of treatment. These results contribute to the growing clinical evidence that nutritional interventions and counseling on physical activity for women with breast cancer treated in the Unified Health System are urgently needed. Studies at other reference centers are recommended.

Key words: Breast Neoplasms; Nutritional Status; Motor Activity; Brazil

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INTRODUCTION

Breast cancer (BC) is now the most common type of cancer among women worldwide. The incidence is usually higher (greater than 80 per 100,000) in developed regions of the world and lower (less than 40 per 100,000) in most of the developing regions[1]. In South Brazil, BC affects 70 for every 100,000 women[2].

It is known that genetics accounts for only 5-10% of all cases, suggesting that environmental factors might play an important role on disease's risk[2,3]. Modifiable risk factors for BC include, among other behaviors, being overweight or obese (for postmenopausal BC) and being physically inactive[3]. According to the Second Expert Report "*Food, Nutrition, Physical Activity and the Prevention of Cancer: a Global Perspective*", about one third of the most common cancers could be prevented through a healthy diet, being physically active and maintaining a healthy weight[4].

On the other hand, women who treat BC and are overweight or obese are related to a poor prognosis. It's also known that physical activity is extremely important in this population, as it decreases the risk of death[5]. But, besides the knowledge that nutritional status may interfere on risk and prognosis of the disease[3-5], it seems that women are still showing a relevant pattern of inactivity, overweight and weight gain[5-7].

Enhancing the information about the nutritional status and physical activity level of people in distinct locations who have BC and start treatment is important as it allows recognizing the actual health situation, establishing priorities and allocating resources directly toward a positive change. In order to clarify the need of greater lifestyle interventions in women who receive treatment from the Brazilian Unified Health System, the aim of this study is to evaluate for the first time the nutritional status and physical activity level in women who treat BC in a reference center in Pelotas (RS/Brazil).

METHOD

This is a cross-sectional study. Data were collected during the course of an Integrated Health Multiprofessional Residence in Nutrition Oncology. One priority established in this kind of educational program is to evaluate specific needs from the assisted population, in order to upgrade future health targets and improve general life quality of people treated by the Brazilian Unified Health System. From June to November 2012, women being at least 20 years old until the 6th treatment cycle were evaluated according to their nutritional status and physical activity level. These patients were receiving chemotherapy treatment from the Brazilian Unified Health System at the University Hospital of Pelotas, a regional reference center for cancer treatment. All participants were evaluated anatomopathologically according to the Tumor-Node-Metastasis system classification of malignant tumours[8].

Study design and procedures were conducted after ethical commission approval by the Ethics Committee for Human Research from the School of Medicine - Federal University of Pelotas (OF 40/12). Procedures were also followed in accordance with the Helsinky declaration and the Resolution CNS 466/12.

Nutritional status was assessed by body mass index (BMI=weight/height²), following the World Health Organization (WHO) proposal[9]. Waist circumference (WC) was measured with a flexible and inelastic tape with extension of 150 cm and division of 0.1 cm, positioned at the narrowest point between the lowest rib and the iliac crest. The diagnosis of abdominal obesity was in accordance with the WHO recommendation for Brazilian population (> 80 cm)[10].

Weight gain was evaluated by the difference between previous weight (collected from medical records) and current weight (interview moment). Current weight was assessed with the patient wearing light clothing, using an electronic balance (*Tanita*®, Model A-080), with 0.1 kg of accuracy and capacity of 150 kg. Height was measured with a portable stadiometer (*Sanny*® Personal Caprice, Brazil) following placement according to Frankfurt plane[9].

Physical activity was assessed by the International Physical Activity Questionnaire (IPAQ)[11], long version, with regard to the field of activity in leisure. We classified physical inactivity (yes / no), defining as non-sedentary the person who had a score equal or greater than 150 minutes per week of physical activity.

Other collected variables included type of chemotherapy (adjuvant, neoadjuvant or palliative), number of treatment cycles, stage of disease (I, II, III or IV), climacteric phase (defined as premenopause/postmenopause[12]), previous nutritional counseling (yes / no), age and educational level (classified in five different degrees).

Data collection was performed by trained staff, who recorded it in form and subsequently registered it into a Microsoft Excel® 2007 file. Analyses were carried out using STATA® version 12.0. For continuous variables description, the average with its standard deviation was used and categorical variables were described as the absolute number and relative frequency. The Chi-square test was used for categorical variables, and the t-Test and Pearson's correlation coefficient for continuous variables. The significance level was 5%, with a confidence interval (CI) of 95%.

RESULTS

During the research period, 78 BC patients were under treatment in the chemotherapy sector of University Hospital of Pelotas. Six patients did not participate in the sample because there was no possibility to collect data or they refused to participate. Finally, 72 women, with an average age of 56 ± 12.2 years old were included in the study. The main sample characteristics are shown in Table 1.

Table 2 shows the classification of nutritional status by anthropometric parameters. According to BMI over 70%

Table 1. Sample characteristics. Pelotas-RS, 2012 (n=72)

Variable	N	%
Age		
31 – 40	6	8.3
41 – 50	20	27.8
51 – 60	18	25.0
≥ 60	28	38.9
Education		
1 (Illiterate / until the 3rd grade of elementary school)	18	25.0
2 (4th grade of elementary school)	30	41.7
3 (Complete primary education)	8	11.0
4 (Complete high school)	12	16.7
5 (Higher education)	4	5.6
Climateric phase		
Premenopausal	17	23.6
Postmenopausal	55	76.4
Stage of tumor		
I	6	8.3
II	20	27.8
III	21	29.2
IV	25	34.7
Type of treatment		
Adjuvant	36	50.0
Neoadjuvant	10	13.9
Palliative	26	36.1
Sedentary lifestyle		
Yes	68	94.4
No	4	5.6

of women were overweight or obese, and the BMI average corresponded to 28.9 ± 4.7 kg/m² (95% CI: 27.7; 30.0). Most of the sample had abdominal obesity, presenting a WC average of 92.1 ± 14.7 cm (95% CI: 88.6; 95.6).

In analyzes involving change in body weight, one patient who had no information about it on medical records was excluded. When the amount of weight gain (n=31) was analyzed, it was possible to observe that 9 women gained 2 kg or less, 13 women gained between 2 to 5 kg and other 9 women gained more than 5 kg, with an average weight gain of 4.5 kg. Considering only women who did adjuvant chemotherapy, the average weight gain was 3.38 kg (95% CI: 1.9; 4.9), with a moderate correlation with the higher number of adjuvant chemotherapy cycles (r =0.53, p=0.009).

Comparing nutritional status of the sample according to BMI before the treatment and at the time of the interview, there was an increase in the percentage of women with an excess amount of weight from 66.2% to 71.8%. According to the climacteric phase, we observed that among the 71 women, 54 were in postmenopausal phase and, between them, 68.5% were overweight before starting treatment.

Table 2. Nutritional status according to anthropometric parameters. Pelotas-RS, 2012 (n=72)

Variable	N	%
BMI on interview time		
Underweight	3	4.2
Normal weight	17	23.6
Overweight	37	51.4
Obesity	15	20.8
BMI before treatment		
Underweight	3	4.2
Normal weight	21	29.6
Overweight	32	45.1
Obesity	15	21.1
Weight gain (n=71)		
Yes	31	43.7
No	40	56.3
Waist circumference		
Abdominal obesity	63	87.5
Normal circumference	9	12.5

Overweight, abdominal obesity and weigh gain occurred independently of any sample characteristics, as shown on Table 3, with exception of weight gain according to the type of chemotherapy. In this case, 64.5% of women who were in adjuvant protocol gained weight, presenting a significant difference when compared to women with other chemotherapy types (p=0.03). Most part of this group (69.5%) were also in earlier BC stages (I and II), but with no statistical significance when compared to stages III and IV. It was also possible to identify 40 women who lost or maintained their weight during the treatment. Among them, 70% had advanced stage (stages III and IV), again with no statistical significance.

Considering the physical activity level of interviewed women, 94.4% did not perform any activity in the leisure domain, with no difference of exercise habit according to educational level (p=0.4), age groups (p=0.5) or type of treatment (p=0.5). Physical inactivity was associated with weight gain, once 87.1% of those that gained weight were considered sedentary (p=0.03). Only 4 women reported having some nutritional counseling previous the interview moment.

DISCUSSION

This study showed that, despite the actual spread knowledge of nutritional status as a modifiable factor for risk and prognosis of BC[4], women with this disease who receive treatment in this reference center still present a sedentary lifestyle, with no nutritional counseling. Furthermore, most part of these women were considered overweight before treatment (with special attention to those in postmenopausal period) and a higher percentage were overweight in the moment of the interview, indicating weight gain. A large amount of patients were also showing an accumulation of

Table 3. Overweight, Abdominal Obesity and Weight Gain according to sample characteristics. Pelotas-RS, 2012 (n=72)

Variable	Overweight[1] n(%)	p*	Abdominal obesity[2] n(%)	p*	Weight gain[3] n(%)	p*
Age		0.7		0.6		0.7
31 – 40	4 (66.7)		5 (83.3)		2 (33.3)	
41 – 50	15 (75.0)		16 (80.0)		10 (50.0)	
51 – 60	17 (85.0)		18 (90.0)		9 (50.0)	
≥ 60	21 (80.8)		24 (92.3)		10 (37.0)	
Education		0.3		0.3		0.3
1	15 (83.3)		17 (94.4)		10 (55.6)	
2	26 (86.7)		26 (86.7)		12 (41.3)	
3	5 (62.5)		7 (87.5)		1 (12.5)	
4	9 (75.0)		11 (91.7)		6 (50.0)	
5	2 (50.0)		2 (50.0)		2 (50.0)	
Climateric phase		0.7		1.0		0.1
Premenopausal	13 (76.5)		25 (88.3)		9 (52.9)	
Postmenopausal	44 (80.0)		48 (87.3)		22 (40.7)	
Stage of tumor		0.8		0.4		0.6
I	5 (83.3)		6 (100)		3 (50.0)	
II	16 (80.0)		17 (85.0)		11 (55.0)	
III	18 (85.7)		20 (95.2)		8 (38.1)	
IV	18 (72.0)		20 (80.0)		9 (37.5)	
Type of treatment		0.9		0.3		0.03
Adjuvant	29 (80.6)		32 (88.9)		20 (64.5)	
Neoadjuvant	8 (80.0)		10 (100)		3 (9.7)	
Palliative	20 (76.9)		21 (80.8)		8 (25.8)	

[1]Overweight was defined as BMI≥25 kg/m²; [2] abdominal obesity was defined as WC≥80 cm; [3]weight gain was defined as a categorical variable (yes/no).
*p value ≥0.05 was considered significant.

abdominal fat, which *per se* is a major risk factor for non-communicable diseases such as cardiovascular disorders, diabetes, and cancer as well[4,13].

A research[14] conducted in 2008 and 2009 in two federal hospitals, in the same region (RS / Brazil), that worked exclusively with the Brazilian Unified Health System, showed that women in these centers also gained weight after diagnosis and during treatment, with a BMI average of 27.68 ± 5.10 kg/m², and WC average of 87.3 ± 11.82 cm after treatment. When participants were questioned about nutritional counseling, over 50% of them referred having no nutritional orientations during chemotherapy, and the majority of those who received some nutritional orientation (97.1%) referred that it was general and not individualized nor monitored. These women gained more weight than the average of 2 to 6 kg indicated as usual in the literature16 and only 32% of women were regularly practicing exercise.

Another study[15] conducted during March and April 2010 aimed to assess the nutritional status and food intake of BC patients receiving care in a specialized breast service in the countryside of the State, linked to the University of Caxias do Sul, also working exclusively with the Unified Health System and attending the referenced population of 45 cities nearby. The results showed that 72% of these women were overweight or obese, with an average BMI of 28.6 ± 5.6 kg/m² and WC of 89.5cm (minimal of 68 and maximum of 113 cm). A high prevalence of physical inactivity (72%) was found as well as poor dietary habits; situations that are irregular with the purpose of avoiding a tumor recurrence[4]. The most part of the sample were already in the final stage of treatment (70%) and in the post-menopausal phase (68%), and the authors concluded that the findings are important to establish newer nutritional interventions that could benefit BC survivors, as well as those in treatment.

These results are of considerable importance once it's possible to realize that the pattern of overweight, high abdominal adiposity, physical inactivity and poor nutritional advice is similar in women with BC in South Brazil in different reference centers, at least since 2008. For now, it's more than clarified that the excess of weight and adiposity is related to the tumor angiogenesis, tumor progression and worsen of prognosis. In addition, obesity and weight gain also increases the risk of recurrence and death in these patients[5,16-18], and all these anthropometric measures are unquestionably bad in women treating or treated in these Unified Health System's centers.

Beside the bad nutritional status and physical activity level found in BC patients in south Brazil, this nutritional situation is not exclusive of this population. A similar cross-sectional survey was conducted in eight general hospitals and four BC support groups in seven states of Peninsular Malaysia[7]. Participants were recruited from February to

December 2008, with a total of 368 women, average age of 53 years old. Overweight and obesity were already prevalent in over 40% of the women prior to diagnosis; however, more women (53%) were overweight and obese at study entry, with 65.7% of them showing an elevated WC measure (≥80 cm).

Although this study was conducted in women with greater educational level and different race (57.1% were Malay, 33.2% Chinese and 9.8% Indian), they also gained weight. They didn't search about nutritional counseling, but they detected poor dietary habits among participants, with a larger amount of weight gain in women who had the habit of eating less fruits and vegetables. When they considered physical activity, women were more active than in the present study, but they didn't correlate the physical activity level according to age or educational status. There was no evidence in the reviewed literature of other studies that correlate educational level with physical activity status in BC patients in treatment.

In the sample of analyzed women in Pelotas, it was also possible to notice that physical activity occurred with no difference according to the educational level, age groups or type of treatment. Overweight, abdominal obesity and weigh gain also occurred independently of age and educational level, what reinforces that all women in treatment must have some additional approach to encourage the habit of regular exercises and constant nutritional orientation. Some special attention must be in those who are in adjuvant protocol, which seemed to be the treatment type that most influences weight gain (p=0.03), as already showed in another studies[19,20]. Despite the results from the present study, lower educational levels can be related to less access to health services and consequently to careless about general health habits and physical activity, allowing gain of weight. Other studies that evaluate the relationship among educational level, physical activity and weight gain are needed to accurately determine whether different health approaches should be planned and directed for individuals of lower educational level.

Mendes et al.[21] also evaluated 66 women undergoing adjuvant chemotherapy in a clinic in São Paulo (SP / Brazil), excluding those with advanced stages. The average weight gain was 2.9 kg and weight increased according to the greater number of treatment cycles. In the same conditions, the average weight gain in the present study was 3.37 kg, with a moderate correlation with the higher number of cycles of adjuvant chemotherapy (r=0.53, p=0.009). It is important to emphasize that maybe with a greater sample of women in adjuvant treatment, this correlation would be more powerful. Despite the correlation between weight gain and the number of chemotherapy cycles, literature is not clear about what causes this effect. It is relevant to suppose that women in adjuvant chemotherapy reduce their activity level after surgery, and start treatment with mobility restrictions. Because of this, they are discouraged to keep themselves active along treatment cycles, and are not guided to reinitiate their normal activities. Certainly, the type of medications and lack of nutritional counseling could also be related to this effect, but further investigations are needed to concretize conclusions.

Although in the present study over 60% of women in adjuvant protocol that gained weight were lying mostly in initial stages (I and II), we couldn't find differences of weight gain among stage groups, but other studies point that earlier stages are more likely to gain weight[20].

This research has some limitations. First of all, there was no healthy control group to compare if nutritional status is as bad in healthy people as it is in BC patients. Although we interviewed all women who were in treatment during the period, it was a small sample to expand our results for other centers. But, on the other hand, we saw that others studies presented some comparable results about nutritional status of their patients and, once this is a reference center, people of diverse regions come for treatment in this service. Another limitation is that this study used self-reported and registered weight before BC diagnosis, which is subject to recall error and consequently could affect the calculation and classification of weight change. This was a cross-sectional study that aimed to describe the current situation on nutritional status and physical activity. It could not imply cause and effect relationship for these parameters. It is also possible that women make lifestyle changes from time to time and that their current habits may be healthier compared to their earlier practices. Although women were asked about nutritional counseling during treatment, the evaluation about eating habits was not performed.

Despite these limitations, it is deeply recommended that nutritional counseling combined with stimulation of physical activity should be performed in order to avoid a bad nutritional situation, as weight gain and body fat accumulation[5,22]. In addition to improve BMI and avoid weight gain, physical activity can increase the survival time of these women[3-5,18]. These are certainly priorities to be established as an adjuvant objective for women referred for treatment, in order to prevent future obesity related diseases and avoid worst outcomes during treatment.

CONCLUSION

Women referred for chemotherapy treatment from the United Health System in this region reference center presented a bad nutritional situation, including an elevated percentage of patients with high BMI and WC, and with no priority for nutritional orientation or good physical activity habits. The results of the current study add to the mounting clinical evidence that interventions aimed at targeting nutritional status disorders and physical inactivity of women with BC treated in the United Health System in South Brazil are urgently needed, with special regard to nutritional counseling. Nutritional attention must be a priority for prevention, once women already initiate

treatment presenting overweight. Furthermore, women with initial stages of the disease tend to gain weight, especially those who receive adjuvant chemotherapy, what indicates that during treatment these women must be stimulated to exercise and keep a healthy weight, healthy anthropometric measures and nutritional orientation. This would be more beneficial early in the cancer trajectory, reducing the risk of posterior comorbidities and preventing a worse prognosis and risk of recurrence.

We recommend that similar studies should be conducted in other region's centers to expand these findings and clarify the need of nutritional interventions.

CONTRIBUTIONS

Rafaela Bülow Bergmann, Idrejane Aparecida Vicari do Vale, Patrícia Abrantes Duval and Renata Torres Abib contributed for the project's design conception and the research methodology. All authors contributed in obtaining, analyzing and interpreting the data and in the final manuscript writing.

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Resumo

Introdução: O estado nutricional e atividade física são fatores modificáveis para o risco e prognóstico do câncer de mama. Conhecer esses parâmetros em diferentes localidades é importante porque permite estabelecer prioridades e alocar recursos para uma mudança positiva. **Objetivo:** Avaliar pela primeira vez o estado nutricional e nível de atividade física em mulheres que tratam o câncer de mama em um Centro de Referência na cidade de Pelotas (RS-Brasil). **Método:** Estudo transversal. Foram avaliadas pacientes acima de 20 anos, tratadas no Sistema Único de Saúde, entre junho e novembro de 2012, utilizando-se o índice de massa corporal, circunferência da cintura, Questionário Internacional de Atividade Física, variação do peso corporal e questionamento sobre orientação nutricional prévia. **Resultados:** Das 72 mulheres avaliadas, 70% encontravam-se com excesso de peso e 87,5% apresentaram elevada circunferência abdominal, com média de 92,1±14,7cm (95% IC: 88,6; 95,6). O sedentarismo associou-se ao ganho ponderal (p=0,03) e foi prevalente em 94,4% das entrevistadas. Aproximadamente 65% das mulheres em tratamento adjuvante aumentaram o peso, com diferença significativa quando comparado aos outros tipos de tratamento (p=0,03). Apenas quatro mulheres referiram ter recebido aconselhamento nutricional previamente. **Conclusão:** A maioria das mulheres avaliadas apresentou-se acima do peso, sedentárias, com obesidade abdominal e sem acompanhamento nutricional no início do tratamento. Esses resultados contribuem para a crescente evidência clínica de que intervenções nutricionais e aconselhamento quanto à atividade física para mulheres com câncer de mama tratadas pelo Sistema Único de Saúde são urgentemente necessários. Estudos em outros Centros de Referência são recomendados.
Palavras-chave: Neoplasias da Mama; Estado Nutricional; Atividade Motora; Brasil

Resumen

Introducción: El estado nutricional y actividad física son factores modificables de riesgo y pronóstico del cáncer de mama. Conocer estos parámetros en diferentes lugares es importante pues esto permite establecer prioridades y destinar recursos hacia un cambio positivo. **Objetivo:** Realizar la primera evaluación del estado nutricional y actividad física en mujeres que se tratan de cáncer de mama en un Centro de Referencia en Pelotas (RS-Brasil). **Método:** Estudio transversal. Fueron evaluadas pacientes mayores de 20 años, atendidas en el Sistema Único de Salud, entre los meses de junio y noviembre del 2012, por el índice de masa corporal, circunferencia de cintura, Cuestionario Internacional de Actividad Física, variación del peso corporal y cuestionamiento sobre orientación nutricional. **Resultados:** Entre 72 mujeres, el 70% estaba con sobrepeso y el 87,5% tenía una elevada circunferencia de cintura, con un promedio de 92,1 ± 14,7cm (IC 95%: 88,6; 95,6). La inactividad física fue asociada al aumento de peso (p=0,03), debe ser considerado que estaba presente en el 94,4% de las entrevistadas. Aproximadamente el 65% de las mujeres sometidas a tratamiento adyuvante aumentaron el peso, con una diferencia significativa comparando con otros tipos de tratamiento (p=0,03). Sólo cuatro mujeres informaron que recibieron asesoramiento nutricional anterior. **Conclusión:** La mayoría de las mujeres en estudio, al inicio del tratamiento, presentaban sobrepeso, sedentarismo, obesidad abdominal y estaban sin asesoramiento nutricional. Estos resultados contribuyen a la creciente evidencia clínica de que las intervenciones nutricionales y asesoramiento sobre actividad física para mujeres con cáncer de mama tratadas en el Sistema Único de Salud son necesarios con suma urgencia. Se recomienda realizar estudios en otros Centros de Referencia.
Palabras clave: Neoplasias de la Mama; Estado Nutricional; Actividad Motora; Brasil