QUALITY OF LIFE, NUTRITIONAL STATUS AND FOOD CONSUMPTION OF WOMEN WITH BREAST CANCER UNDERGOING CHEMOTHERAPY

Qualidade de vida, estado nutricional e consumo alimentar de mulheres com câncer de mama em tratamento quimioterápico

Calidad de vida, estado nutricional y consumo alimentario de mujeres con cáncer de mama en tratamiento de quimioterapia

Original Article

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ABSTRACT

Objective: To assess the quality of life, nutritional status and food consumption of women diagnosed with breast cancer undergoing chemotherapy. **Methods:** Analytical cross-sectional study conducted with 70 women aged 30 to 59 years in a hospital in Rio Grande do Sul from May to October 2015. The European Organization for Research and Treatment of Cancer Quality of Life Questionnaire C30 (EORTC QLQ- C30) was applied. The anthropometric variables collected were: current weight, height, mid-upper arm circumference, waist circumference, hip circumference and triceps skinfold. Food consumption was assessed using the 24-hour dietary recall. **Results**: Overweight and obesity were found in 37.1% and 37% of the women, respectively, according to body mass index. The average intake of calories, carbohydrate, lipids, cholesterol, fibers, calcium and iron was significantly lower than the recommended, particularly with regard to nutrients such as fibers (91.4% of the cases), calcium (87.7% of the cases) and iron (over 90% of the cases). However, the average intake of proteins (72.9% of the cases > 15% of TC) and vitamin C (over 50% of the cases) was higher than the recommended. **Conclusion:** The quality of life of women with breast cancer undergoing chemotherapy was considered low and they presented a high prevalence of overweight and obesity. In addition, the intake of protein and vitamin C was higher than the recommended while the intake of calories, carbohydrates, lipids, cholesterol, fiber, calcium and iron was lower than the recommended. There was no significant association between quality of life and nutritional status.

Descriptors: Breast Neoplasms; Drug Therapy; Eating; Nutrition Assessment; Quality of Life.

RESUMO

Objetivo: *Avaliar a qualidade de vida, o estado nutricional e o consumo alimentar de mulheres diagnosticadas com câncer de mama em quimioterapia.* **Métodos:** *Estudo transversal e analítico envolvendo 70 mulheres, de 30 a 59 anos, em um hospital do Rio Grande do Sul, no período de maio a outubro de 2015. Aplicou-se o questionário European Organization for Research and Treatment of Câncer Quality of Life Questionnaire C30 (EORTC QLQ- C30). As variáveis antropométricas coletadas foram: peso atual, altura, circunferência braquial, circunferência da cintura, circunferência do quadril e prega cutânea tricipital. O consumo alimentar foi avaliado pelo recordatório alimentar de 24 horas.* **Resultados:** *Sobrepeso e obesidade foram encontrados respectivamente em 37,1% e 37% das mulheres de acordo com o índice de massa corporal. A média do consumo de calorias, carboidratos, lipídios, colesterol, fibras, cálcio e ferro foi significativamente inferior à recomendação, com destaque para nutrientes como fibras (91,4% dos casos), cálcio (87,7% dos casos) e ferro (mais de 90% dos casos). No entanto, o consumo médio de proteínas (72,9% dos casos > 15% do VCT) e vitamina C (mais de 50% dos casos) foi superior ao recomendado.* **Conclusão:** *A qualidade de vida das mulheres com câncer de mama em quimioterapia foi considerada baixa e elas apresentaram uma elevada prevalência de sobrepeso e obesidade. Além disso, o consumo alimentar foi superior à recomendação para proteínas e vitamina C, e inferior para calorias, carboidratos, lipídios, colesterol, fibras, cálcio e ferro. Não foi observada associação significativa entre qualidade de vida e estado nutricional.*

Descritores: *Neoplasia de Mama; Quimioterapia; Ingestão Alimentar; Avaliação Nutricional; Qualidade de Vida.*

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RESUMEN

Objetivo: *Evaluar la calidad de vida, el estado nutricional y el consumo alimentario de mujeres diagnosticadas de cáncer de mama en quimioterapia.* **Métodos:** *Estudio transversal y analítico con 70 mujeres entre 30 y 59 años en un hospital de Rio Grande do Sul en el período entre mayo y octubre de 2015. Se aplicó el cuestionario European Organization for Research and Treatment of Câncer Quality of Life Questionnaire C30 (EORTC QLQ- C30). Las variables antropométricas recogidas fueron: el peso actual, la altura, el perímetro braquial, la circunferencia de la cintura, la circunferencia de la cadera y el pliegue cutáneo tricipital. El consumo alimentario fue evaluado a través del recordatorio de 24 horas.* **Resultados:** *El sobrepeso y la obesidad fueron encontrados respectivamente en el 37,1% y el 37% de las mujeres según el índice de masa corporal. La media del consumo de calorías, carbohidratos, lípidos, colesterol, fibras, calcio y hierro fue de manera significativa inferior a de la recomendación, en especial para los nutrientes como las fibras (91,4% de los casos), el calcio (87,7% de los casos) y el hierro (más del 90% de los casos). Sin embargo, el consumo medio de proteínas (72,9% de los casos > 15% do VCT) y vitamina C (más del 50% de los casos) fue superior al recomendado.* **Conclusión:** *La calidad de vida de las mujeres con cáncer de mama en quimioterapia fue considerada baja y hubo elevada prevalencia de sobrepeso y obesidad. Además, el consumo alimentario ha sido superior a la recomendación de las proteínas y la vitamina C e inferior para las calorías, carbohidratos, lípidos, colesterol, fibras, calcio y hierro. No ha sido observada asociación significativa entre la calidad de vida y el estado nutricional.*

Descriptores: *Neoplasias de la Mama; Quimioterapia; Ingestión de Alimentos; Evaluación Nutricional; Calidad de Vida.*

INTRODUCTION

Worldwide, breast cancer (BC) is the second most common and frequent type of cancer death in women. In Brazil, BC mortality rates are still high probably due to late diagnosis in advanced stages. In Brazil, 57,960 new BC cases are expected in 2016, with a risk of 56.20 cases per 100,000 women. The projection does not include the non-melanoma skin tumors, whose incidence rates are higher in women from the South (74.30/100 thousand), Southeast (68.08/100 thousand), Midwest (55.87/100 thousand) and Northeast (38.74/100 thousand). In the North region, it is the second most incident tumor (22.26/100 thousand)[1].

In this context, the Ministry of Health established the National Cancer Care Policy (*Política Nacional de Atenção Oncológica*), which recognizes cancer as a public health problem and assists in the development of actions for its control through a Cancer Care Network (*Rede de Atenção Oncológica*) with the direct and indirect participation of the federal government, the state and municipal health secretariats, universities, health services, research centers, non-governmental organizations, and the society in general[2].

The main risk factors for BC are related to age and endocrine and genetic aspects. The increased risk for BC development is related to a history of early menarche, late menopause, first pregnancy after age 30, nulliparity, and postmenopausal hormone replacement therapy, especially if it lasts for more than five years. Other factors include exposure to ionizing radiations, regular alcohol consumption, obesity, especially when weight gain occurs after menopause, and sedentary lifestyle. Family history, especially in first-degree relatives before age 50, is also an important risk factor for BC. However, hereditary BC corresponds to circa 5-10% of all cases[3,4].

The three main BC screening methods are mammographic screening, clinical examination and self-examination. Mammography is still the most effective way to detect early changes in breast cancer. However, while easy access to mammography does not become a reality for all Brazilian women, self-examination and clinical examination of the breasts will continue to be important auxiliary methods for the diagnosis of various breast diseases[5]. BC treatment modalities consist of surgery, radiation therapy, chemotherapy and hormonal therapy[6].

Concomitant to the various treatments used, changes in nutritional status and in dietary patterns may occur, especially excessive weight gain, which is one of the most observed changes in this population group. These changes are frequently mentioned by patients and are present in all stages of the disease; they are caused by, among other reasons, the discomforts, physiological changes and side effects of the treatment[7-9].

In addition to the nutritional impact, other changes may be triggered during treatment, including: physical, mental, emotional, social and functional changes, which affect relationships, health perceptions, life satisfaction, well-being, treatment results and patient's satisfaction with it, health status and future prospects, leading to a compromise in quality of life[10,11]. Changes in the emotional and financial dimensions, in the sexual satisfaction and in future prospects of BC patients have already been found in the literature along with the most reported symptoms: fatigue, insomnia and loss of appetite[12].

One of the most used quality of life questionnaires in the oncology context is the European Organization for Research and Treatment of Cancer Quality of Life Questionnaire (EORTC QLQ-C30)[12]. This quality of life research tool is also used as an assessment tool[13,14]. In addition to women's quality of life, obesity and several chronic and degenerative

diseases are recognized as risk factors for BC and are associated with a worse prognosis after cancer diagnosis, which negatively affects systemic therapy and contributes to treatment morbidity and to an increase in the risk of secondary malignancies, comorbidities and mortality[15,16]. Therefore, considering the changes caused by breast cancer itself and the chemotherapy treatment, the present study aimed to assess the quality of life, nutritional status and food consumption of women diagnosed with breast cancer undergoing chemotherapy.

METHODS

This is an observational and analytical cross-sectional study conducted with female patients diagnosed with BC treated at a public hospital in the backlands of the Vale do Taquari, Rio Grande do Sul, Brazil. Inclusion criteria were adult women diagnosed with BC undergoing exclusive chemotherapy treatment. Exclusion criteria were: patients exposed to radiation therapy, pregnant women, infants, and individuals who were not able to participate in the anthropometric and/or food consumption assessment due to health issues, or who were unable to answer the questionnaires required by the study.

The sample size was determined based on the results of a study that assessed the association between nutritional status and quality of life of women with BC in Iran[17]. The sample included 70 women and considered the difference in the quality of life score, an 80% power, a significance level of 5%, and a 10% allowance for potential losses. All adult women served from May to October 2015 were invited to participate in the study. Data were collected from those who voluntarily participated in the research and signed the Free Informed Consent Form.

The European Organization for Research and Treatment of Cancer Quality of Life Questionnaire C30 (EORTC QLQ-C30), which is a validated questionnaire targeted at cancer patients, was used. The EORTC QLQ-C30 is a multidimensional questionnaire consisting of 30 questions that assesses the physical and psychological domains, the level of independence, social aspects and the surrounding environment. The score of the questions is given on Likert-type scales, with a minimum value of 0 and a maximum value of 100. Values close to 100 indicate better quality of life, except in the symptom scales, which assess the severity of the symptoms – therefore, the higher the value the lower the quality of life[10].

The anthropometric variables collected were: current weight (CW), height, mid-upper arm circumference (MUAC), waist circumference (WC), hip circumference (HC) and triceps skinfold (TSF). Based on these measurements, the following variables were measured: body mass index (BMI) and mid-arm muscular circumference (MAMC). The current weight was measured using a Cadence digital floor scale with a capacity of 150 kg and a graduation of 100g; height was measured using a Sanny mobile stadiometer with a limit of 2.10 meters and a graduation of 1 mm. BMI was defined by the following formula: BMI = weight (kg)/ height^2 (m^2). It was then classified according to criteria proposed by the World Health Organization (WHO), i.e., underweight (BMI <18.5 Kg/m^2), normal weight (BMI 18.5-24.99 kg/m^2), overweight (BMI 25-29.99 kg/m^2) and obesity (BMI ≥ 30.00 kg/m^2)[18].

The MUAC was measured at the midpoint between the acromion and the olecranon with the arm flexed towards the thorax[19]. The volunteer was then asked to extend the arm along the body with the palm of the hand toward the thigh. At the midpoint, the arm was wrapped with a tightly fitting Sanny inelastic tape measure of 150 centimeters long. The same midpoint used for MUAC measurement was used to measure TSF. After obtaining these measures, the MAMC and the percentage of adequacy of MUAC and MAMC were calculated, which were considered for nutritional status classification according to the cutoff points of the percentiles proposed by NHANES (National Health and Nutrition Examination Survey), i.e.: severe malnutrition (< 70%), moderate malnutrition (70-80%), mild malnutrition (80-90%), normal weight (90-100%), overweight (110-120%) and obesity (>120%)[20]. Triceps skinfold was measured using a Neo adipometer a scale from 0 to 80 mm.

WC was measured at the waistline of the individual, which is the narrowest part of the trunk, and the HC was measured at the maximum extension of the buttocks[21]. Patients with WC equal to or greater than 80 cm were classified as having a high risk for cardiovascular disease, while those with WC equal to or greater than 88 were classified as having a very high risk for cardiovascular diseases[18].

In order to provide a better identification of patients at nutritional risk, a Patient-generated Subjective Global Assessment (*Avaliação Subjetiva Global específica para pacientes oncológicos – ASG-PPP*) specifically designed for cancer patients was used. This assessment is a practical tool that obtains information about symptoms considering aspects of clinical history and functional capacity, classifying the individual into: a) well nourished, b) moderately malnourished or suspected malnutrition, and c) severely malnourished[22].

Food consumption was assessed using a 24-hour dietary recall, which analyzed the food and beverages consumed on the day before the assessment. These data were entered in the *DietWin Profissional* software (2008) to determine the

nutritional composition of the diet and the caloric intake of the patients. Intake of macronutrients was compared to the recommendations of the WHO/FAO (Food and Agricultural Organization)[23], while micronutrient intake was compared to daily intake recommendations (DRIs)[24]. The relative frequency of patients with macro and micronutrient intake within the recommended was calculated and the adequacy of the number of daily servings of the different food groups was calculated and analyzed according to the recommendations of the Food Guide for the Brazilian Population (*Guia Alimentar para a População Brasileira*)[25]. In addition, a structured questionnaire developed by the researchers was applied to investigate the presence of potential risk factors for BC development, such as age, education, age at menarche, presence or absence of menopause, number of children, breastfeeding, contraceptive use, current or pre-existing smoking, alcohol consumption, family history of cancer, and current practice of physical activity.

Data were tabulated in a spreadsheet in Microsoft Office Excel (2003) and are described using descriptive statistics, mean and standard deviation for quantitative parametric variables; median and interquartile range for quantitative nonparametric variables; and absolute and relative frequency for qualitative variables. One sample t-test was used to compare food consumption and nutritional recommendations. The correlation between anthropometric variables and quality of life was analyzed using the Pearson's correlation coefficient. Statistical analyzes were performed using SPSS version 18.0, with values of $p < 0.05$ being considered significant.

The research was approved by the Research Ethics Committee of the Univates University Center (*Centro Universitário Univates*), according to Resolution 466/2012 of the National Health Council, under Opinion No. 1.004.585/2015, and by the hospital board, code 001 of February 24, 2015.

Table I - General characteristics of patients with breast cancer undergoing chemotherapy. Lajeado, Rio Grande do Sul, 2015.

Characteristic	n (%)
Cancer location	
Right breast	34 (48.6%)
Left breast	36 (51.4%)
Previous treatment	
Radical mastectomy	24 (34.3%)
Setorectomy	8 (11.4%)
Breast segmentectomy	4 (5.7%)
Breast-conserving surgery	7 (10%)
Other	27 (39.6%)
Previous breast cancer	16 (22.9%)
Family history of breast cancer	31 (44.3%)
Hormone replacement therapy	
For more than five years	0 (0%)
For less than five years	1 (1.4%)
Never	69 (98.6%)
Contraceptive use	
For more than five years	50 (71.4%)
For less than five years	12 (17.1%)
Never	8 (11.4%)
Age at menarche (years)	13.07±1.61
Age at menopause	
Menopause not started	16 (22.5%)
Before age 55	50 (70.4%)
At age 55 or over	4 (5.6%)
Smoking	
Current	5 (7.1%)
Former	7 (10%)
Drinking	0 (0%)

RESULTS

The sample of patients with breast cancer included in the present study had a mean age of 55.73 ± 11.38 years and 7.66 ± 3.22 years of study. Table I presents the descriptive statistical analysis of the clinical characteristics and life habits of the participants. About 22.9% (n=16) of the participants have had previous breast cancer, 44.3% (n=31) had a family history of the disease, 70.4% (n=50) reported having started menopause before age 55, 71.4% (n=50) reported using oral contraceptives for more than five years, 10% (n=7) reported being a former smoker, and none of them reported current consumption of alcohol.

Table II presents the descriptive statistics regarding the nutritional status of the participants of the present study. According to the BMI, the majority of the participants were overweight (37.1%, n=26) and obese (37.1%, n=26). The assessment of the nutritional status through the ASG-PPP showed that the majority of the participants were well nourished (98.6%; n=69). It was observed that the patients

Table II - Characterization of the nutritional status of women with breast cancer undergoing chemotherapy. Lajeado, Rio Grande do Sul, 2015.

Variables	Descriptive statistics
Current weight (kg)[1]	74.01±15.50
Usual weight (kg)[1]	74.71±18.77
Height (cm)[1]	160.36±6.11
Body mass index (kg/m²)[1]	28.69±5.61
Thinness[2]	1 (1.4%)
Normal weight[2]	17 (24.3%)
Overweight[2]	26 (37.1%)
Class I obesity[2]	19 (27.1%)
Class II obesity[2]	4 (5.7%)
Class III obesity[2]	3 (4.3%)
Arm circumference (cm)[1]	32.37±4.90
Arm Circumference Classification	
Malnutrition	7 (10%)
Normal weight	33 (47.1%)
Overweight	14 (20%)
Obesity	16 (22.9%)
Waist circumference (cm)[1]	93.92±12.87
Hip circumference (cm)[1]	108.05±12.62
Waist-to-hip ratio	
Normal	8 (10.8%)
Moderate risk	15 (20.3%)
High risk	47 (63.5%)
Triceps Skinfold (mm)[1]	30.36±7.35
Mid-arm muscular circumference (mm)[1]	22.85±3.20
Mid-arm muscular circumference classification	
Normal weight	59 (84.3%)
Malnutrition	11 (15.7%)
ASG – PPP Classification[2]	
A – Well nourished	69 (98.6%)
B – Moderately malnourished	0 (0%)
C – Severely malnourished	1 (1.4%)

cm: centimeters; mm: millimeters; Kg: kilogram
Results described as mean and standard deviation for quantitative variables[1] and absolute value (n) followed by respective frequency (%) for qualitative variables[2]. ASG – PPP: *Avaliação Subjetiva Global Produzida pelo Próprio Paciente* (Patient-generated Subjective Global Assessment).

had an increased mean WC. In fact, only 10.8% (n=8) of the patients had WC values within the normal range, while 20.3% (n=15) presented increased WC. Most patients (63.5%; n=47) presented WC values that indicated increased cardiovascular risk. The nutritional status assessment based on the percentage of adequacy of MUAC revealed that the majority of the patients were at normal weight (47.1%, n=33), while 20.0% (n=14) were overweight, 22.9% (n=16) were obese, and less than 10% (7) were underweight. The percentage of adequacy of MAMC showed that 84.3% (n=59) of the patients were at normal weight while the others were classified as malnourished.

Table III - Assessment of food consumption according to recommendations (DRIs) in patients with breast cancer undergoing chemotherapy. Lajeado, Rio Grande do Sul, 2015.

Nutritional composition	Descriptive statistics	Recommendation (%)	p value
Total calories			
kcal/day	1415.74 ± 638.74	-	-
kcal/kg/day	19.74 ± 9.66	25	<0.001*
Carbohydrates (% of TC)	53.07 ± 10.90	55-75	<0.001*
Proteins (%% of TC)	18.48 ± 5.27	10 a 15	<0.001*
Lipids (%% of TC)	28.32 ± 8.99	15 a 30	0.003*
Cholesterol (mg/day)	168.09 (108.05 - 325.94)	300	<0.001*
Fiber (g/day)	11.92 (8.12 - 15.82)	25	<0.001*
Calcium (mg/day)	544.08 (380.56 - 770.23)	1000	<0.001*
Iron (mg/day)	8.30 (5.34 - 10.81)	18	<0.001*
Vitamin C (mg/day)	81.82 (37.33 - 135.77)	75	0.023

TC: Total calories in the diet; Kcal: kilocalories; Kg: kilograms; mg: milligrams; g: grams. Results described as mean and standard deviation or median and interquartile range. *Values of p<0.05 are considered statistically significant: one sample t-test.

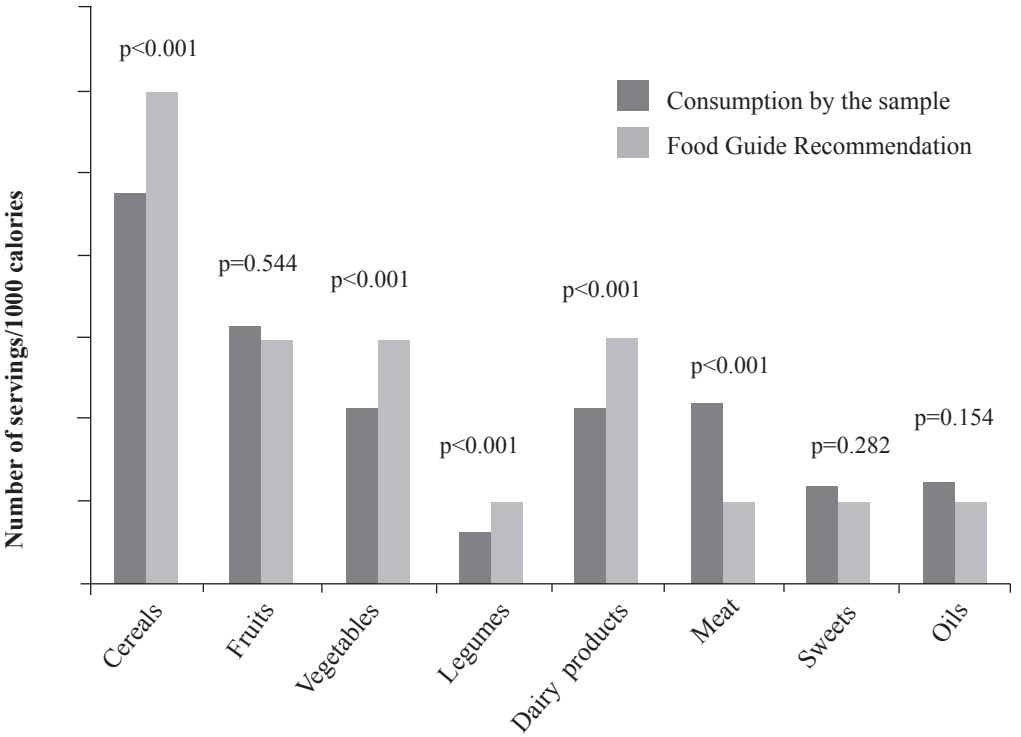

Figure 1 - Number of servings/1000 calories of foods consumed by women with breast cancer undergoing chemotherapy in relation to the recommended in the Food Guide. Lajeado, Rio Grande do Sul, 2015.
Values of p<0.05 are considered statistically significant: one sample t-test.

Table III presents the nutritional composition of the diet of the participants of the present study in comparison to the recommendations. The mean intake of calories, carbohydrates, lipids, cholesterol, fiber, calcium and iron was significantly lower than the recommended, while the mean intake of protein and vitamin C was significantly higher than the recommended. Only 21.4% (n=15) of the patients presented caloric intake above 25 calories/kg/day, as proposed by the Brazilian Oncology Consensus (*Consenso Brasileiro de Oncologia*). More than half of the patients presented carbohydrate intake below 55% of total daily calories (55.7%; n=39). Protein intake was higher than 15% of TC in 72.9% (n=51) of the participants, whereas lipid intake was below 30% of TC in 61.5% (n=43) of the participants. Regarding fiber intake, only 9.6% (n=7) of the patients presented intake equal to or above the recommendations, while 12.3% (n=9) of the patients presented calcium intake within the recommended values for the age; additionally, only five (6.8%) patients presented an adequate iron intake. On the other hand, more than half of the patients presented adequate intake of vitamin C (53.4%; n=39) and cholesterol (69.9%; n=51).

Figure 1 shows the comparison between the mean number of servings consumed by the participants of the present study and the number of servings recommended by the Food Guide for the Brazilian Population (*Guia Alimentar para a população Brasileira*) for each food group, adjusted to 1000 kcal. The consumption of fruits, oils and sweets did not differ significantly from the number of recommended servings, while the consumption of cereals, vegetables, dairy products, and legumes was significantly lower than recommended. Regarding meat, the number of servings consumed by the participants in the present study was significantly higher than the recommendation.

The mean quality of life score in the QLQ-C30 multi-dimension quality of life questionnaire was 38.04 ± 11.37 points.

There was no significant correlation between quality of life and the anthropometric indicators of body weight, BMI, WC, HC, MUAC, TSF and MAMC. The association between quality of life and nutritional status assessed through the ASG-PPP could not be determined since only one patient was classified as ASG-C while the others were classified as ASG-A. For the analysis of association between BMI and quality of life score, the participants were regrouped into three categories (low weight, normal weight, and excessive weight), but no significant difference was observed in the QLQ-C30 scores (p=0.954), reinforcing the lack of association between nutritional status and quality of life in the sample of patients with breast cancer analyzed (data not shown).

DISCUSSION

The present study demonstrated a high prevalence of excessive weight among participants, food consumption different from the recommendations for healthy eating, relatively low quality of life scores and no significant association between anthropometric indicators and quality of life indicators. It is understood that these factors are of utmost importance in the prognosis of cancer patients and in the promotion of health within this population.

The majority of the participants presented some degree of overweight and obesity, which has also been found in a cross-sectional study conducted in Juiz de Fora, Minas Gerais, with 65 women, 64.60% of whom were overweight or obese according to BMI[26]. Another study conducted at the Regional Integrated Oncology Center (*Centro Regional Integrado de Oncologia – CRIO*) in Fortaleza, Ceará, with 114 patients with BC, revealed that 46.15% of the participants were overweight and 23% were obese[27]. In addition, in a study carried out in two hospitals on the east coast of the Malaysian peninsula, more than half of the patients were obese or overweight[28]. Another study that analyzed data from 2,455 early-stage BC patients admitted to the Hacettepe University Cancer Institute in Turkey revealed that 898 (36.2%) were overweight and 704 (29.2%) were obese[29].

The assessment of the nutritional status through the ASG-PPP showed that the majority of the participants were well nourished in the present study, a result that is similar to that of the study carried out at the Borges da Costa Outpatient Clinic of the Hospital das Clínicas of the Federal University of Minas Gerais (*Universidade Federal de Minas Gerais – UFMG*), in which 78 women were analyzed and the majority (80.8%) were considered well nourished[30].

In the present study, the mean intake of calories, carbohydrates, lipids and cholesterol was significantly lower than the recommended; however, the patients were overweight and obese, which suggested that they did not follow a healthy diet. In a study carried out in Fortaleza with BC patients, food consumption was characterized by insufficient energy intake, deficient contribution of carbohydrates and fibers, and excessive intake of protein, salt and sodium[31]. In another study conducted in Spain with 112 BC survivors, the total energy, fat and carbohydrate intake of the diets was also low among the patients[32]. This finding may be explained by the common biases in food questionnaires, such as underestimation of consumption and/or intake of certain foods, and memory bias, in which the individual may not accurately remember information on intake or the quantity of food consumed. In contrast, results from a European cohort study conducted with 242,918

postmenopausal women showed that women who had a healthy diet had a lower risk of developing the disease[33].

The consumption of cereals, vegetables, dairy products, and legumes was significantly lower than the number of servings recommended for the sample of women with BC analyzed in the present study. Results from a study carried out at the Hospital das Clínicas of the UFMG showed that the consumption of foods such as cereals, vegetables and dairy products was below the number of recommended servings, while the consumption of legumes, meats, sugar and sweets, and oils was above the recommended[34]. In another study conducted with 58 women with BC followed at a specialized cancer treatment center in the city of Fortaleza, there was a higher relative frequency of patients with consumption of vegetables and legumes, total cereals, and milk and dairy products lower than the recommended[35].

The mean QLQ-C30 score in the present study was 38.04 ± 11.37, which is considered low when compared to the results of two cross-sectional studies, one conducted with 152 patients from São Paulo, in which the mean QOL measured by the same instrument was 74.91 ± 23.36[36], and the other one carried out in Fortaleza with 145 women with BC undergoing chemotherapy, in which the Global Quality of Life score found was 76.14 ± 23.54[37].

In the present study, no significant correlation was found between quality of life and nutritional status, a result that is different from that of a study that assessed the quality of life of patients in Bangladesh and found that improved family income, nutritional status and work environment may have an impact on the improvement of the quality of life of BC patients during the treatment phases[38]. A cross-sectional study with 100 Iranian BC survivors demonstrated that survivors with better nutritional status presented better functioning scales and fewer clinical symptoms[17]. In view of these findings, it should be noted that sociodemographic and clinical differences in treatment modalities and nutritional status tend to present variances according to the sample analyzed. In this sense, it becomes feasible to find differences in the findings on quality of life in the studies described above and in our study.

One limitation of the present study is the inclusion of women with BC in different stages of chemotherapy treatment, which can influence in many ways their quality of life and nutritional status. However, the study presents the following strengths: the representative sample of the population of interest at the local level, the assessment of different anthropometric indicators and a validated and specific nutritional screening method for cancer patients.

CONCLUSION

The quality of life of women undergoing chemotherapy was considered low and they present a high prevalence of overweight and obesity. In addition, food consumption was above the recommended for proteins and vitamin C and below the recommended for calories, carbohydrates, lipids, cholesterol, fiber, calcium, and iron. No significant association between quality of life and nutritional status was found.

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