RESEARCH ARTICLE

Body Image of Women Submitted to Breast Cancer Treatment

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Abstract

   Background: The study of body image includes the perception of women regarding the physical appearance of their own body. The objective of the present study was to verify the prevalence of body image dissatisfaction and its associated factors in women submitted to breast cancer treatment. **Methods:** A cross-sectional study carried out with 103 female residents of the municipality of Natal (Northeast Brazil), diagnosed with breast cancer who had undergone cancer treatment for at least 12 months prior to the study, and remained under clinical monitoring. The variable body image was measured through the validated Body Image Scale (BIS). Socioeconomic variables and clinical history were also collected through an individual interview with each participant. The Pearson's chi-squared test (Fisher's Exact) was utilized for bivariate analysis, calculating the prevalence ratio with 95% confidence interval. Poisson regression with robust variance was utilized for multivariate analysis. The statistical significance considered was 0.05. **Results:** The prevalence of body image dissatisfaction was 74.8% CI (65%-82%). Statistically significant associations were observed between body image and multi-professional follow-up (p=0.009) and return to employment after treatment (p=0.022). **Conclusion:** It was concluded that women who reported employment after cancer treatment presented more alterations in self-perception concerning their appearance. Patients who did not receive multi-professional follow-up reported negative body image, evidencing the need for strategies that increase and improve healthcare, aiming to meet the demands of this population.

Keywords: Oncology- breast neoplasms- body image- public health- women

Introduction

   Breast cancer presents a high incidence and mortality rates especially among young women in Brazil and around the world (Ferlay et al., 2013). When diagnosed early, this type of cancer is considered to have a good prognosis (Tao et al., 2015). In Brazil the estimate for the year 2020 indicates the occurrence of 83 thousand new cases of breast cancer in women (Ferlay, 2013). Although Brazil has a free public health system, diagnosis frequently occurs in advanced stages which negatively affects mortality rates (Cecílio et al., 2015).

   Difficulty regarding access to health services in developing countries should be are therefore highlighted, causing delays between initial investigations and confirmation of diagnosis, and thus generating repressed demand for cancer treatment (Cecilio et al., 2015). In recent decades, the adoption of effective tracking programs, especially in developed countries, has enabled reductions in mortality rates (Mathew et al., 2016); more

and more women survive breast cancer (Siu, 2016).

   In addition to early diagnosis, therapies used to treat neoplasia such as surgery, chemotherapy, radiotherapy and hormone therapy, have also contributed to the increase in cancer survivors. However, these treatments frequently result in serious alterations in the appearance of patients, including breast asymmetry and changes in skin texture and sensitivity (Chua et al., 2015; Sherman et al., 2016). Adverse effects of the treatment also include nausea, vomiting, fatigue, alopecia, weight gain, paleness, and induced menopause. The latter results in increased ob-gyn-related complaints regarding decreased vaginal lubrication, excitation, and sexual desire, affecting body image and the sex life of women (Assis et al., 2013; Peerawong et al., 2016).

   In recent years, there has been an increase in the number of studies dedicated to female breast cancer survivors, especially regarding the complications that stem from cancer treatment, aiming to improve the quality of life of these women (Dahl et al., 2010; Fang

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et al., 2013; Morone et al., 2014). The study of body image has emerged in the scientific literature, describing the perception of these patients regarding the physical appearance of their own body (Fang et al., 2013).

Breasts are important for female beauty and sexuality, constituting the female body image, which includes individual self-perception and observation of the reaction of others (White, 2000). Therefore, body image relates to the satisfaction or dissatisfaction of an individual with his/her body (Dahl et al., 2010). In breast cancer patients, body image may suffer changes related to the presence of the tumor, such as alterations in the skin (texture and sensitivity), changes in weight, and breast asymmetry and size as well as changes related to the oncologic treatment (Chua et al., 2015; Cordero, 2015; Dahl et al., 2010).

Evaluation of body image enables better comprehension of how the stress experienced by women, due to cancer and its treatment, affects self-esteem and social participation as well as how body image is reformulated by these women (Assis et al., 2013; Morone et al., 2014).

The majority of studies with breast cancer patients demonstrate the efficacy of therapeutic approaches and surgical techniques, and emphasize the survival analysis of this group of women after oncologic treatment (Fielding, Lam, 2014). Thus, knowledge of the prevalence of dissatisfaction with body image and identification of the associated factors in women survivors of breast cancer will enable improvement in health approaches related to actions and services that can minimize the negative repercussions generated by the treatment in women survivors of breast cancer.

Materials and Methods

Participants and procedures

This is a cross sectional study, carried out at the Rio Grande do Norte League Against Cancer (reference center for cancer treatment), in the city of Natal (State of Rio Grande do Norte, Northeast Brazil). Women with a diagnosis of breast malignant neoplasm (C50), according to the International Disease Classification (CID-10), in the period 2013-2014 participated in the study.

The sample was constituted by women that resided in the municipality of Natal, submitted to cancer treatment at least one year before the study and who were still under clinical monitoring at the specialized assistance unit, Advanced Oncology Center (CECAN), of the Rio Grande do Norte League Against Cancer. Women presenting a cognitive deficit that hindered comprehension of the questionnaires applied during the interviews were excluded from the study, along with those with mobility difficulties and/or those presenting debilitating/disabling morbidities not associated with breast cancer and its treatment, as well as patients in a critical state/ palliative care.

Calculation of the sample considered a 79.2% prevalence of body image dissatisfaction in women submitted to neoadjuvant and/or adjuvant treatment for breast cancer, according to data collected and evaluated by the pilot study of this research project, carried out with 48 patients. An Error Factor (EF) of 7% was considered,

resulting in the inclusion of 129 participants in the study sample.

Data collection took place between July/2015 and May/2016. Initially, medical records were accessed for the previously selected patients from the Cancer League Registry System, through systematic sampling. The following data were extracted: clinical history and whether the patient was monitored by a multi-professional team.

In the first phase of the study, information was collected from 240 medical records (this number was 46.25% higher than the sample calculated, allowing for possible losses in the initial contact stage with patients). Of the 240 medical records assessed, 147 women were contacted by phone and invited to participate in the study. Of the invited women, 44 patients were excluded based on the exclusion criteria. All participants entered the study after giving written, informed consent to participate in the study.

In the second phase, the patients selected for participation in the study underwent individual interviews with an average duration of 40 minutes, for assessment of socioeconomic variables (race/skin color, education level, income, professional occupation/employment before and after breast cancer treatment, housing arrangements), clinical history (secondary complications to treatment), and the variable related to body image.

The Body Image Scale (BIS) (Hopwood, 2001) was utilized to measure body image, consisting of ten items developed to evaluate three dimensions: affective/ emotional, behavioral, and cognitive. The scores are processed by a Likert scale that varies from (0) "nothing" to (3) "very much". Recent studies have proposed a cutoff point to classify women regarding their satisfaction with body image. On the basis of the final score, the cutoff point is 10 points: values higher than 10 points indicate dissatisfaction, and equal to or below 10 points indicate satisfaction with body image (Morone et al., 2014; Rhondali, 2015). The BIS scale presents good reliability and internal consistence ($\alpha=.93$) (Moreira et al., 2010).

All questions and explanations were provided to the patient by the study researcher.

Data Analysis

The dependent variable body image was dichotomized into two categories: dissatisfied and satisfied. Initially, results were presented through descriptive statistics. Bivariate analysis was then carried out, using the Pearson's chi-squared and Fisher's Exact tests to verify the magnitude of association through the prevalence ratio (PR) of each nominal categorical independent variable regarding the dependent variable.

Multivariate analysis was carried out with Poisson's regression with robust variance and a 95% confidence level.

Quantitative variables were categorized in tertiles or as dichotomic variables (categorization using the median), when necessary, for bivariate analysis. Statistical data analysis was carried out with software (SPSS) 20.0.

The project was approved by the Human Research Ethics Committee (protocol nº 1.149.608).

Results

One hundred and three women treated for breast cancer were included in the study, with an average age of 55.97 years (±10.6). The majority were (51.5%) Caucasian, married or living with a partner (49.5%), presenting high education levels (complete high school or graduate studies), and a monthly income under one minimum wage (52.4%). Regarding professional occupation, it was observed that a great share of women were employed before cancer diagnosis (81.6%), but 35% did not return to work after finishing treatment. Access to health services was mostly public (50.5%), and 74.8% (CI 95%, 65%-82%) of women reported dissatisfaction with body image.

The association between body image dissatisfaction and professional occupation/employment before treatment was statistically significant in the bivariate analysis. Associations between body image and age, income, race/skin color, marital status, education level, access to health services, and return to labor activities after cancer treatment were not statistically significant (Table 1).

Neoadjuvant cancer treatment for breast cancer was significantly associated with the body image dissatisfaction of women submitted to treatment, as well as with multi-professional clinical follow-up. Regarding secondary morbidities to breast cancer treatment, the presence of necroses and dehiscences was identified, related to immediate post-operatory conditions. For late morbidities, paresthesia was significantly associated with body image (Table 2).

In the multivariate analysis, after testing all variables in different ways, the proposed model demonstrated a significant relationship between dissatisfaction with body image and the absence of multi-professional follow-up and the presence of an occupation after breast cancer treatment. This result was established after adjusting the model by age, marital status, surgery technique, and breast reconstruction (Table 3).

Discussion

The results of this study showed a 74.8% prevalence of body image dissatisfaction in women submitted to

Table 1. Bivariate Analysis between Socioeconomic Variables and Body Image Dissatisfaction of Women Submitted to Breast Cancer Treatment

	Satisfied	Unsatisfied		
	n (%)	n (%)	p*	PR (95% CI)
Age [a]				
57 years or over	8 (17.0)	39 (83.0)	0.078	1.22 (0.97-1.52)
Under 57 years	18 (32.1)	38 (67.9)		1.00
Race/Skin color				
White/Caucasian	15 (28.3)	38 (71.7)	0.462	0.91 (0.73-1.15)
Other	11 (22.0)	39 (78.0)		1.00
Marital status				
Married	13 (25.5)	38 (74.5)	0.954	0.99 (0.79-1.24)
Other	13 (25.0)	39 (75.0)		1.00
Education level				
Illiterate/fundamental school	16 (26.6)	44 (57.0)	0.694	0.95 (0.76-1.19)
High school/Graduate studies	10 (23.4)	33 (76.7)		1.00
Income				
Under one minimum wage	17 (31.5)	37 (68.5)	0.176	0.85 (0.67-1.07)
Two minimum wages or over	9 (19.6)	37 (80.4)		1.00
Housing arrangements				
Owned	23 (26.2)	65 (73.8)	0.613	0.92 (0.69-1.22)
Rented/Other arrangements	3 (20.0)	12 (80.0)		1.00
Employment before treatment				
No	1 (5.3)	18 (94.7)	0.026	1.34 (1.13-1.60)
Yes	25 (29.8)	59 (70.2)		1.00
Employment after treatment				
No	20 (16.7)	47 (70.2)	0.142	1.00
Yes	6 (29.8)	30 (83.3)		1.18 (0.95-1.47)
Access to health services				
Public	16 (30.8)	36 (69.2)	0.192	0.86 (0.68-1.07)
Private/Health plan	10 (19.6)	41 (80.4)		1.00

*, p-values from chi2 tests; [a], The cutoff point was defined based on the median age; PR, prevalence ratio; CI, confidence interval

Table 2. Bivariate Analysis between Characteristics of Treatment Charateristics and Secondary Complications to Treatment and Unsatisfaction with Body Image of Women

	Satisfied	Unsatisfied		
	n (%)	n (%)	p*	PR (95% CI)
Multi-professional follow-up				
No	3 (10.4)	26 (89.6)	0.009	1.30 (1.06-1.58)
Yes	23 (31.0)	51 (69.0)		1.00
Surgery technique				
Non conservative	15 (33.4)	30 (66.6)	0.088	0.84 (0.67-1.05)
Conservative	10 (17.8)	46 (82.2)		1.00
Time of surgery[a]				
Over 27 months	9 (18.7)	39 (81.3)	0.183	1.16 (0.93-1.45)
Between 6 and 26 months	16 (30.2)	37 (69.8)		1.00
Type of surgery				
Non conservative	15 (33.4)	30 (66.6)		0.81 (0.63-1.03)
Conservative	10 (17.8)	40 (82.2)		1.00
Axillary approach				
Axillary lymphadenectomy	16 (30.8)	36 (69.2)	0.192	0.86 (0.68-1.07)
No	10 (19.6)	41 (80.4)		1.00
Breast reconstruction				
No	13 (21.7)	47 (78.3)	0.514	1.08 (0.85-1.36)
Yes	11 (27.5)	29 (72.5)		1.00
Neoadjuvant treatment				
Yes	10 (45.5)	12 (54.5)	0.044	0.68 (0.45-1.01)
No	16 (20.0)	64 (80.0)		1.00
Adjuvant treatment				
Yes	26 (25.3)	75 (74.3)	0.407	3.14 (0.71-1.39)
No	0 (0)	2 (100.0)		1.00
Early complications				
Yes	8 (36.3)	14 (63.7)	0.176	0.81 (0.58-1.14)
No	18 (22.2)	63 (77.8)		1.00
Late complications				
Yes	23 (32.0)	49 (68.0)	0.017	0.75 (0.61-0.91)
No	3 (9.6)	28 (93.3)		1.00
Necrosis/dehiscence				
Yes	5 (83.3)	1 (16.7)	0.004	0.21 (0.03-1.27)
No	21 (21.7)	76 (78.3)		1.00
Seroma				
Yes	6 (30.0)	14 (70.0)	0.585	0.92 (0.67-1.25)
No	20 (24.0)	63 (76.0)		1.00
Winged scapula				
Yes	1 (25.0)	3 (75.0)	0.991	1.00 (0.56-1.78)
No	25 (25.3)	74 (74.7)		1.00
Lymphedema				
Yes	17 (39.1)	14 (60.9)	0.082	0.51 (0.34-0.76)
No	9 (21.3)	63 (78.7)		1.00
Pain				
Yes	18 (31.6)	39 (68.4)	0.099	0.82 (0.66-1.03)
No	8 (17.4)	38 (82.6)		1.00
Paresthesia				
Yes	18 (36.0)	32 (64.0)	0.015	0.75 (0.04-0.40)
No	8 (0.15)	45 (85.0)		1.00

*, p-values from chi2 tests; [a], The cutoff point was defined based on the median time since treatment; PR, prevalence ratio; CI, confidence interval

Table 3. Multivariate Analysis between Characteristics of Patients and Treatment and Unsatisfaction with Body Image of Women Submitted to Breast Cancer Treatment

	Satisfied	Unsatisfied	p*	PR (95% CI)**
Age [a]				
57 years or over	8 (17.0)	39 (83.0)	0.078	1.19 (0.96-1.48)
Under 56 years	18 (32.1)	38 (67.9)		1.00
Marital status				
Married	13 (25.5)	38 (74.5)	0.954	1.03 (0.83-1.28)
Other	13 (25.0)	39 (75.0)		1.00
Employment after BCT				
Yes	6 (29.8)	30 (83.3)	0.142	1.30 (1.06-1.58)
No	20 (16.7)	47 (70.2)		1.00
Multi-professional follow-up				
Yes	23 (31.0)	51 (69.0)	0.009	0.81 (0.67-0.97)
No	3 (10.4)	26 (89.6)		1.00
Breast reconstruction				
No	13 (21.7)	47 (78.3)	0.514	1.11 (0.90-1.38)
Yes	11 (27.5)	29 (73.5)		1.00
Type or surgery				
Non conservative	15 (33.4)	30 (66.6)	0.088	0.84 (0.67-1.05)
Conservative	10 (17.8)	46 (82.2)		1.00

*, p-values from chi2 tests; **, Mutually adjusted for all variables shown in the table; [a], The cutoff point was defined based on the median age; PR, prevalence ratio; CI, confidence interval.

breast cancer treatment. Data were provided by the only reference center for cancer treatment in Natal (Northeast Brazil). The absence of multi-professional follow-up/ monitoring and return to work after breast cancer treatment were significantly associated with body image dissatisfaction, independent of the age of patients, marital status, breast reconstruction, and type of surgery.

Previous studies in developed countries have established the prevalence of women who experienced some degree of concern with body image as between 15% and 33% (Dahl et al., 2010; Fingeret et al., 2014). Runowicz et al., (2016) reported prevalences between 31% and 67% for body image alterations in female breast cancer survivors. The authors highlighted this aspect as an important area of concern, with respect to the long term physical and psychosocial effects related to breast cancer and its treatment. These values were lower than those presented herein, which could be related to the difficulty in developing countries, such as Brazil, to provide comprehensive access to health services - as a consequence, late diagnosis occurs along with higher dissatisfaction with the repercussions caused by cancer treatment.

Another factor that could be related to the high body image dissatisfaction prevalence rates is the time elapsed since surgery. According to Fingeret et al., (2013), patients who undergo breast cancer treatment seem to experience high body image dissatisfaction rates until two years after treatment. In the present study, the patients evaluated were between the first and second year of clinical monitoring and the time elapsed since surgery was not associated with body image dissatisfaction.

Regarding breast cancer support, this should include post-treatment care for survivors (Ganz, 2013). Care involves several areas such as monitoring cancer recurrence and the symptoms after treatment as well as evaluation of physical and psychosocial necessities, support to patients, and counseling on lifestyle modifications to prevent morbidities and improve quality of life (Ganz, 2013; Pauwels et al., 2013). Although many clinical directives exist for diagnosis and treatment of breast cancer, there is still little evidence available in the scientific literature on the long term monitoring of survivors. In addition, increasing survival rates implies in multi-disciplinary monitoring to satisfy the different demands of women after initial treatment (Pauwels et al., 2013; Morone et al., 2014; Runowicz et al., 2016).

Even years after cancer treatment, women report questions and uncertainties about the disease, fear of relapse, and a lack of information on: i) treatments and follow-up protocols; ii) changes in lifestyle; iii) detection of relapse symptoms; and iv) prevention in first-degree relatives (Vidotti et al., 2013). In this context, body image occupied third place, with 53.8%, in the classification of the necessity for information and support reported by female breast cancer survivors (Pauwels et al., 2013). The absence of complaints can occur due to discontinuity in assistance, as the reduction in physical symptoms leads to decreases in the frequency of contact between patients and the multi-professional team, which ultimately suppresses the needs and demands of women (Vidotti et al., 2013).

The American Cancer Society/American Society of Clinical Oncology publishes guidelines for breast cancer survivors, which carries recommendations regarding monitoring/follow-up of patients, including body image. According to these guidelines, alterations caused by breast

cancer treatment can lead to changes in body image, with short and long term negative repercussions in the quality of life of patients. Therefore, health professionals should evaluate the concerns of the patients regarding body image, offering adaptive devices (e.g., breast forms, wigs, and/or surgery when indicated) and referral to psychosocial assistance (Runowicz et al., 2016). The occurrence of these symptoms and the absence of a multi-disciplinary team to monitor and guide patients are factors that could justify a higher prevalence of body image dissatisfaction in women who do not receive multi-professional monitoring.

Besides multi-disciplinary monitoring, the return to work also presented a significant association with body image dissatisfaction. This finding can be explained by the fact that body image suffers the influence of self-perception, which is guided by the beauty standards of society and by the reaction of society to the appearance of the individual (Rhondali, 2015). Body image also includes an attitude of body satisfaction or dissatisfaction, which varies depending on the investment in appearance and self-assessment (Dahl et al., 2010). Investment in appearance refers to the value or importance given by the individual to physical attributes (Brunet, 2013).

Women submitted to cancer treatment, when returning to work, are more exposed to the opinion of others and to beauty standards, which could cause negative self-evaluation of their own image. These attitudes are evaluated in the scientific literature, based on the model developed by White (2001), in which cancer can cause changes in the organization of beauty, generating negative experiences based on beliefs, feelings, and thoughts (Brunet, 2013).

A different hypothesis was formulated in a recent study on Korean female breast cancer survivors. According to the authors, employment was significantly associated with changes in self-image perception as women who returned to employment experienced more distress related to their appearance. This was mainly caused by lack of social support in the working environment, as well as negative attitudes towards cancer patients, with serious repercussions on social activities and work performance. Patients who returned to employment presented higher dissatisfaction with body image then patients who were unemployed (Chang et al., 2014), which corroborates the findings presented herein.

Returning to work after cancer treatment gives the idea of returning to normality, routine, and daily tasks, promoting improvement in quality of life for cancer survivors (Tan et al., 2012). Advances in early detection methods have promoted an increase in survival of breast cancer patients and consequently an increase in the number of women capable of returning to the labor market. However it is necessary for these women to receive monitoring/follow-up with the objective of preparing them to address and deal with changes in their bodies, helping maintain high self-esteem and minimizing the negative effects related to body image (Tan et al., 2012; Pauwels et al., 2013).

Although the variables breast reconstruction and type of surgery were not significantly associated with body image in female breast cancer survivors in the present study, these variables have presented relevance in the scientific literature and were therefore included in the adjustment model of the study. Breast reconstruction is considered an important factor for higher body image satisfaction, which makes this one of the main objectives related to integral care, and is a requirement for effective monitoring (Fingeret et al., 2014). Breast reconstructive surgery should be indicated for those patients who are not comfortable with the result of the initial surgical procedure; as well as breast forms and special bras, as a way to increase self-esteem (Runowicz et al., 2016).

Other variables included in the model due to their importance were age and marital status. Regarding age, the literature points out that younger women present higher dissatisfaction with appearance, reporting low self-esteem with significant reduction in quality of life (Paterson et al., 2016; Recio-Saucedo et al., 2016). Some factors contribute to the increased prevalence in this population, such as the loss of a breast due to the type of surgery technique employed, which can result in scars and physical changes such as hair loss and weight alterations, the inability to have children, and the risk of early menopause. On the other hand, maturity, accompanied by the climacteric period, multiple births, and professional and financial fulfillments seem to positively influence body image (Rosenberg, 2013; Paterson et al., 2016). The average age of the participants in the present study was 55 years; however age did not influence body image, which could be explained by the fact that age presented low variation across participants, with a relatively homogeneous sample regarding age.

With respect to marital status, some authors remark that the opinion of the spouse can influence the decision towards the type of surgery and reconstruction. In addition, approximately 33% of the women in the present study experienced issues in their relationships, due to decreased body image satisfaction and sex life, reflecting the negative impact of surgery on body image and quality of life of patients (Andrzejczak, 2013; Gomes, 2015; Peerawong et al., 2016).

Two main limitations of the study must be mentioned at this point: difficulty in accessing the sample (the initial contact was made through a phone call) and the fact that the evaluated women resided exclusively in the municipality of Natal.

In recent years, studies have been carried out with the objective of researching body image in women who have undergone breast cancer treatment; however there is scarce information in the literature for the Brazilian population, specifically for Northeast Brazil.

The results of this study support the hypothesis that treatment for breast cancer negatively alters the perception of body image. This issue stems mainly from the absence of multi-professional monitoring and also from employment commitments after treatment - these women are more exposed to cultural, environmental, and socioeconomic factors of society as well as issues directly linked to the work environment.

These results will contribute to improving clinical

management regarding the need for a multi-disciplinary team for the evaluation and intervention of women submitted to breast cancer treatment, since the present study points out a gap in the short and long term follow-up of these patients.

The presence of professionals specialized in the follow-up care after the initial therapeutic approach, focusing on aspects that directly influence body image, could minimize the frequent repercussions during this period in order to improve self-esteem, quality of life, and social and work relationships of these women.

Conflict of interest statement
None.

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References

Andrzejczak E, Markocka-Mączka K, Lewandowski A (2013). Partner relationships after mastectomy in women not offered breast reconstruction. *Psychooncology*, **22**, 1653–7.

Assis MR, Marx AG, Magna LA, et al (2013). Late morbidity in upper limb function and quality of life in women after breast cancer surgery. *Braz J PhysTher*, **17**, 236-43.

Brunet J, sabiston CM, burkeC (2013). Surviving breast cancer: Women's experiences with their changed bodies. *Body Image*, **10**, 344– 51.

Cecilio AP, Takakura TE, Jumes JJ, et al (2015). Breast cancer in Brazil: epidemiology and treatment challenges. *Breast Cancer*, **7**, 43–9.

Chang O, Choi EU, Kim IR, et al (2014). Association between socioeconomic status and altered appearance distress, body image, and quality of life among breast cancer patients. *Asian Pac J Cancer Prev*, **15**, 8607-12.

Chua AS, Desantis SM, Teo I, et al (2015). Body image investment in breast cancer patients undergoing reconstruction: Taking a closer look at the appearance schemas inventory-revised. *Body Image*, **13**, 33–7.

Cordero MJA (2015). Breast cancer and body image as a prognostic factor of depression: a case study in México City. *Nutr Hosp*, **31**, 371-9.

Dahl CAF, Reinertsen KV, Nesvold IL, et al (2010). A study of body image in long-term breast cancer survivors. *Cancer*, **1**, 3549-57.

Fang S, Shu B, Chang Y (2013). The effect of breast reconstruction surgery on body image among women after mastectomy: a meta-analysis. *Breast Cancer Res Treat*, **37**, 13–21.

Ferlay J, Soerjomataram I, Ervik M, et al (2013). F. Globocan (2012) v1.0, Cancer incidence and mortality worldwide: IARC cancer base No. 11 [Internet]. Lyon, France: International Agency for Research on Cancer; 2013. Available from: http://globocan.iarc.fr, accessed on 04/2016.

Fielding R, Lam WWT (2014). Psychosocial and physical outcomes after surgery for breast cancer: a 5-to-6-year follow-up. *Hong Kong Med J*, **20**, 9-10.

Fingeret MC, Teo I, Epner DE (2014). Managing body image difficulties of adult cancer patients. *Cancer*, **23**, 633-41.

Ganz PA (2013). Supportive care after curative treatment for breast cancer (survivorship care): Resource allocations in low- and middle-income countries. A breast health global initiative 2013 consensus statement. *Breast J*, **22**, 606-15.

Gomes NS, Soares MBO, Silva SR (2015). Autoestima e qualidade de vida de mulheres submetidas à cirurgia oncológica de mama. *Rev Min Enferm*, **19**, 120-6.

Hopwood P, Fletcher I, Lee A, et al (2001). A body image scale for use with cáncer patients. *Eur J Cancer*, **37**, 189–97.

Mathew A, George PS, Arjunan A, et al (2016). Temporal trends an future pretition of breast cancer incidence across age groups in Trivandrum, south India. *Asian Pac J Cancer Prev*, **17**, 2895-9.

Moreira H, Silva S, Marques A, et al (2010). The Portuguese version of the Body Image Scale (BIS) – psychometric properties in a sample of breast cancer patients. *Eur J Oncol Nurs*, **14**, 111–18.

Morone G, Iosa M, Fusco A, et al (2014). Effects of a multidisciplinary educational rehabilitative intervention in breast cancer survivors: The role of body image on quality of life outcomes. *Sci World J*, **2014**, 1-11.

Pauwels EJ, Charlier C, Bourdeaudhuij ID, et al (2013). Care needs after primary breast cancer treatment. Survivors' associated sociodemographic and medical characteristics. *Psychooncology*, **22**, 125–32.

Paterson CL, Lengacher CA, Donovan KA, et al (2016). Body image in younger breast cancer survivors. *Cancer Nurs*, **39**, 1-20.

Peerawong T, Phenwan T, Supanitwatthana S, et al (2016). Breast conserving therapy and quality of life in Thai females: a mixed methods study. *Asian Pac J Cancer Prev*, **17**, 2917-21.

Recio-Saucedo A, Gerty S, Foster C, et al (2016). Information requirements of young women with breast cancer treated with mastectomy or breast conserving surgery: A systematic review. *Breast J*, **25**, 1-13.

Rhondali W (2015). Screening for body image dissatisfaction in patients with advanced cancer: A pilot study. *J Palliat Med*, **18**, 151-6.

Rosenberg SM (2013). Body image in recently diagnosed young women with early breast câncer. *Psychooncology*, **22**, 1849–55.

Runowicz CD, Leach CRL, Henry NL, et al (2016). American cancer society/American society of clinical oncology breast cancer survivorship care guideline. *Cancer J Clin*, **66**, 43–73.

Sherman KA, Woon S, French J, et al (2016). Body image and psychological distress in nipple-sparing mastectomy: the roles of self-compassion and appearance investment. *Psychooncology*, **26**, 337-45

Siu AL (2016). Screening for breast cancer: U.S. preventive services task force recommendation statement. *Ann Int Med*, **164**, 279-97.

Tan FL, Loh SY, Su T, et al (2012). Return to work in multi-ethnic breast cancer survivors – A qualitative inquiry. *Asian Pac J Cancer Prev*, **13**, 5791-7.

Tao Z, Shi A, Lu C, et al (2015). Breast cancer: Epidemiology and etiology. *Cell Biochem Biophys*, **72**, 333-8.

Vidotti JF, Scorsolini-comin F, Santos MA (2013). Qualidade de vida em sobreviventes de longo prazo ao câncer de mama: análise da produção científica. *Psicol Teor Prat*, **15**, 49-68.

White CA (2000). Body image dimensions and cancer: A heuristic cognitive behavioural model. *Psychooncology*, **9**, 183–92.