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Article

Is Body Appreciation a Moderator of Women's Satisfaction and Distress with the Body Changes that Occur after Breast Cancer Surgery? A One-Year Longitudinal Study

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Abstract

Women with breast cancer show dissatisfaction with their appearance, a perception of loss of femininity and bodily integrity, and dissatisfaction with the outcome of the surgery. Body Appreciation (BA) is defined as positive attitudes toward one's body, beyond satisfaction and dissatisfaction with one's appearance. Although studies about the protective role of BA have increased, to the best of our knowledge, there are no published studies on the association between BA, body dissatisfaction, and distress in participants with breast cancer. The aims of this study are: (a) To analyze whether BA is a moderator of satisfaction with the body from before breast surgery to the one-year follow-up; and (b) to analyze whether BA is a moderator of distress from before breast surgery to the one-year follow-up. The sample consisted of 115 women diagnosed with breast cancer. Several hierarchical regression analyses were conducted. The results indicated that BA moderated the association between the appearance evaluation before the surgery and the appearance evaluation 12 months after the surgery. Although BA was a significative predictor of distress, it was not a moderator of distress from the moment before breast surgery to the one-year follow-up. This study highlights the importance of evaluating the construct of BA in participants with breast cancer using longitudinal designs and developing psychological interventions that focus on increasing BA.

Keywords: body appreciation; body satisfaction; breast cancer; longitudinal

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Body image is a multidimensional construct that consists of beliefs and thoughts related to physical appearance, its assessment, and satisfaction with one's body (Cash & Psruzinski, 2002), the perception of the whole body and each of its parts, as well as its movements, limitations, subjective experiences, thoughts, and feelings, and the individual's evaluations of these cognitions or thoughts (Cash, 2004; Cash & Smolak, 2011).

Breast cancer is a chronic disease that affects patients' emotional well-being and psychological adjustment. Surgical treatment may involve the removal of one or both breasts, and radiotherapy can leave scars and skin changes (Davis et al., 2020). In participants with breast cancer, body image dissatisfaction has been widely studied (e.g., Sebri et al., 2021), and studies have found that participants showed dissatisfaction with their appearance, a perception of loss of femininity and bodily integrity, an avoidance of nakedness, feelings of being less attractive, and dissatisfaction with the outcome of the surgery (Fobair et al., 2006; Martins-Faria et al., 2021). Additionally, White and Hood (2011) found that women showed body dissatisfaction one year after mastectomy. Moreover, psychological distress due to body changes can sometimes exacerbate pre-existing psychological vulnerabilities or psychopathology, such as anxiety and depression (Sebri et al., 2021; Thakur et al., 2022). Although extensive research has been carried out on body image in breast cancer (e.g., Brunet & Price, 2021; Brunet et al., 2022; Ettridge et al., 2022), longitudinal studies of the association between body image and distress after surgery are scarce. For example, in the Davis et al. (2020) meta-analysis of body image in cancer survivors, only 2 out of the 5 selected studies were longitudinal (Figueiredo et al., 2004; Speck et al., 2010). Therefore, as far as we know, there are no longitudinal studies on body image and breast cancer in the Spanish population. Moreover, most of the previous studies have not used specific instruments to assess body image and distress. Instead, they evaluated mental health and body image using a broad quality of life (QOL) measure, which may lower the reliability of the assessments. In addition, most of the studies did not assess whether or not the patient had a mental disorder. Finally, Davis et al. (2020) indicated that no studies had been carried out to analyze protective variables. Thus, in order to go one step further in the study of body image in

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cancer survivors, it would be necessary to carry out longitudinal studies on body image in Spanish participants.

Positive body image is multifaceted and includes aspects such as acceptance, love, and investment in an adaptive appearance. Positive body image broadly conceptualizes beauty as an inner positivity that radiates outward, manifests as adaptive behavior, and filters information in a body-protective manner. Thus, positive body image is a distinct construct from negative body image (Tylka & Wood-Barcalow, 2015; Webb et al., 2015).

Positive body image is commonly operationalized as body appreciation (Ávalos et al., 2005), which is defined as positive attitudes toward one's body, beyond satisfaction and dissatisfaction with appearance. It includes a favorable opinion about one's physical characteristics, regardless of weight, shape, and imperfections, as well as respect for and attention to the body's needs through the adoption and implementation of healthy behaviors, protection of the body, and the rejection of social-media ideals of beauty (Ávalos et al., 2005; Tylka, 2012).

In a recent meta-analysis, Linardon et al. (2022) found that body appreciation was negatively associated with eating disorder psychopathology, body image disturbance, and general psychopathology, and it was positively associated with self-esteem and other well-being factors such as sexual satisfaction (Satinsky et al., 2012). Women with high body appreciation were more critical of images of idealized beauty (Holmqvist & Frisén, 2012), and previous studies found that body appreciation was associated with different indicators of health, mental health, and well-being (Linardon et al., 2023; Marta-Simões et al., 2016).

Although studies examining the protective role of body appreciation have increased considerably in the past decade, most of the studies have been cross-sectional, and Linardon et al. (2022) recommend studying the predictive or mediating role of body appreciation in well-being constructs in longitudinal studies. In addition, most of the studies published to date have been carried out with Anglo-Saxon samples, and so it is necessary to conduct research in other different cultures, such as Spanish-speaking countries. Finally, to the best of our knowledge, there are no published studies on the association between body appreciation and body dissatisfaction in participants with breast cancer that have undergone surgery during medical treatment.

Cognitive behavioral therapy (CBT) is the treatment of choice to improve body image in people with breast cancer; however, a recent meta-analysis indicated that its efficacy was moderate (Sebri et al., 2021). If we found that body appreciation was a protective factor for body dissatisfaction and distress in participants with breast cancer, it would allow us to develop new therapeutic treatment modules focused on body appreciation to improve the efficacy of cognitive behavioral therapy (e.g., CBT skills for radical acceptance of the body as it is, despite the changes wrought by cancer).

Considering the previously mentioned premises, the aims of this study are: (a) To analyze whether body appreciation is a moderator of feelings of physical attractiveness from the moment before the breast surgery to the one-year follow-up, and (b) to analyze whether body appreciation is a moderator of distress from the moment before breast surgery to the one-year follow-up.

We hypothesize that body appreciation could be a moderator of feelings of physical attractiveness from the moment before the breast surgery to the one-year follow-up. Moreover, we hypothesize that body appreciation could be a moderator of distress from before breast surgery to the one-year follow-up.

Method

Participants and Procedure

The sample consisted of n = 115 women diagnosed with breast cancer from the Functional Breast Pathology Unit at the University Hospital in Valencia, Spain, during an 18-month period. The inclusion criteria were: (a) Women diagnosed with breast cancer (b) who were 18 years old or more (c) and provided their informed consent. Women with advanced disease (Stage IV), intellectual or hearing disability, or a diagnosis of schizophrenia, eating disorders, or borderline personality disorder were excluded.

The mean age was 59.99 years (SD = 10.74). Regarding the marital status of the participants: n = 15 (13.1%) were single; n = 75 (65.2%) were married; n = 9 (7.8%) were divorced; and n = 16 (13.9%) were widowed. As for the level of studies, n = 4 (3.47%) participants reported not having studies, n = 40 (34.78%) had primary studies, n =37 (32.17%) had a medium level of education, and n = 34 (29.6%) had a higher education level. At the time of diagnosis, n = 68 (59.2%) reported being housewives, compared to n = 47 (40.8%) who had a job. Regarding the psychological characteristics of the sample, n = 100 (87%) participants had no previous psychological diagnosis, whereas n = 9 (7.9 %) reported mood disorders, n =1 (0.9%) reported anxiety, n = 3 (2.6%) reported experiencing grief, and n = 2 (1.7%) reported having problems in a family relationship.

The medical characteristics of the sample were the following: For n = 109 (94.8%), it was their first diagnosis of breast cancer, compared to n = 6 (5.2%) who were facing recurrent breast cancer. All the participants (n = 115) received surgical treatment; n =33 (28.7%) underwent radical surgery, and n = 82 (71.3%) had conservative surgery, of whom n = 43 (52.4%) had a quadrantectomy and n = 39 (47.5%) had a lumpectomy. A total of 34.8%, n = 40, of participants had undergone immediate breast reconstruction, and 65.2%, n = 75, participants had had no immediate breast reconstruction. Furthermore, 45.2%, n = 52, of participants had surgical removal of lymph nodes in the armpit area, and 54.8%, n = 63 did not. Regarding the cancer treatment after surgery, n = 70 (60.9%) patients received neoadjuvant chemotherapy, n = 43 (37.4%) received radiotherapy, and n = 2 (1.7%) did not receive chemotherapy or radiotherapy.

Procedure

Four evaluation sessions were conducted by an experienced health psychologist. In the first assessment session (T1), one month before the surgery, the study aim was explained, as well as the length of each session, and patients gave their informed consent. The second assessment session (T2) took place approximately three months after the surgery, the third assessment session (T3) was held approximately eight months after the surgery, and the fourth session occurred 12 months after the surgery (T4).

The present study was reviewed, registered with number 2015/0317, and approved by the Ethics Committee of the Hospital where the data were obtained, and so it meets the ethics criteria for clinical research.

Measurements

Body Appreciation Scale (BAS; Ávalos et al., 2005). The BAS has been utilized by researchers to understand features, correlates, and potential outcomes of positive body image. The BAS assesses the positive aspects of body image, a favorable opinion about physical traits, acceptance of the body despite its weight, shape, and imperfections, respect towards the body, and attention to its needs (e.g., "I

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have a positive attitude towards my body"; "I appreciate the different and unique characteristics of my body"; "I feel that my body has at least some good qualities"). It is composed of a single dimension and uses a 13-item Likert scale, where a score of 1 represents *never* and 5 represents *always*. Average scores are used to obtain the body appreciation index. High scores represent greater acceptance and a more favorable opinion and respect for the body (Tylka & Wood-Barcalow, 2015). The BAS was adapted to Spanish by Jáuregui Lobera and Bolaños Ríos (2011). It presents adequate psychometric properties (α =. 88) and has adequate psychometric properties in our sample (α =. 73).

Multidimensional Body-Self Relations Questionnaire-Appearance Scales (MBSRQ-AS; Cash, 2000). This self-administered inventory contains 34 items that measure the attitudinal aspects of body image. It contains five subscales: Appearance Evaluation, Appearance Orientation, Body Areas Satisfaction, Overweight Preoccupation, and Self-Classified Weight. In its adaptation to the Spanish population (Roncero et al., 2015), it shows adequate psychometric properties (α range. 76 to. 87). In this study, only the Appearance Evaluation subscale was used. The Appearance Evaluation subscale assesses feelings of physical attractiveness or unattractiveness, that is, satisfaction or dissatisfaction with one's looks. High scorers mostly feel positive and satisfied with their appearance, whereas low scorers experience a general unhappiness with their physical appearance. Each item is scored on a 5-point Likert scale ranging from 1: *Strongly disagree* to 5: *Strongly agree* or from 1: *Very dissatisfied* to 5: *Very satisfied*. The subscale shows adequate psychometric properties in our sample (α =. 80).

The Brief Symptoms Inventory (BSI–18, Derogatis, 2013). The BSI–18 is a self-applied test that consists of 18 items referring to physical, anxious, and depressive symptoms, with responses given on a 4-point Likert scale ranging from 0 (*not at all*) to 4 (*very much*). For our study, we calculated the Global Severity Index (GSI), which combines the number of symptoms and the intensity of distress. High scores represent greater distress, discomfort, anxiety, depression, and somatization symptoms. The GSI is considered a good predictor of the subject's distress (Galdón et al., 2008). The BSI–18 showed adequate reliability indices (α =. 89) in our sample.

Statistical Procedure

First, descriptive statistics and zero-order correlations (Pearson's coefficient) were calculated for the variables. Second, a hierarchical regression analysis was conducted to examine whether Body Appreciation at T4 moderated the association between Appearance Evaluation at T1 and Appearance Evaluation at T4. In the first step of this analysis, Appearance Evaluation at T1 was entered. In the second step, Appearance Evaluation at T1, Body Appreciation at T4, and the interaction term between Appearance Evaluation at T1 and Body Appreciation at T4 were entered. The same analysis was performed with the Brief Symptoms Inventory at T1 and the Brief Symptoms Inventory at T4. If the addition of the interaction term in the second step added significant predictive variance to the regression model, this would indicate a moderating effect of Body Appreciation at T4 in the association between Appearance Evaluation at T1 and Appearance Evaluation at T4, and between the Brief Symptoms Inventory at T1 and the Brief Symptoms Inventory at T4 (Frazier et al., 2004). Analyses were performed using the enter method. Data were analyzed using the macro PROCESS for SPSS 28.

Results

Before the surgery (T1), n = 115 patients were assessed, and while they were completing the stages of the treatment, the sample decreased for several reasons. At three months after the surgery (T2), it was only possible to evaluate n = 112 (97.3%) participants because the other three (2.7%) patients were being followed-up by another medical specialty in the hospital. At eight months after surgery (T3), n = 97 (84.34%) participants were evaluated, n = 4 (3.5%) participants were being followed-up by another medical specialty in the hospital, and n = 14 (12.2%) had not yet completed the current treatment phase. At one-year follow-up after the surgery (T4), n = 73 participants were evaluated, n = 10 (8.7%) participants were being followed up by another medical specialty in the hospital, and 35 (30.4%) participants had not yet completed the current treatment phase.

As Table 1 shows, for Appearance Evaluation at T1, there was a strong and positive correlation with Appearance Evaluation at T4

Table 1. Mean and Zero Order Correlations for the Variables in Participants

	M(SD)	AE T2	AE T3	AE T4	BAS T1	BAS T2	BAS T3	BAS T4	BSI–18 T1	BSI–18 T2	BSI–18 T3	BSI–18 T4
AET1	3.90(.98)	.54**	.47**	.64**	.38**	.19*	–.06	.18*	–.10	–.12	–.06	.05
AE T2	3.26(.67)		.82*	.75**	.35**	.20*	.54**	.43**	.11	–.05	–.22*	–.23*
AE T3	3.40(.71)			.83**	.24*	.30**	.37**	.49**	.10	–.11	–.24**	–.33**
AE T4	3.54(.64)				.28*	.27**	.31**	.36**	.05	–.16	–.25*	–.24**
BAS T1	4.23(.27)					.30**	.36**	.41**	–.03	–.06	–.15	–.05
BAS T2	4.02(.33)						.37**	.41**	–.03	–.32**	–.04	–.06
BAS T3	3.86(.35)							.59**	–.11	–.18*	–.31**	–.43**
BAS T4	3.91(.32)								–.12	–.31**	–.30**	–.53**
BSI–18 T1	11.12(6.92)									.41**	.51**	.19*
BSI–18 T2	8.84(6.52)										.44**	.39**
BSI–18 T3	9.39(6.01)											.48**
BSI–18 T4	7.25(5.77)											

Note. AE = Appearance Evaluation; BAS = Body Appreciation Scale; BSI–18 = Brief Symptom Inventory–18; T1 = Assessment before the surgery; T2 = Assessment three months after the surgery; T3 = Assessment 8 months after the surgery; T4 = Assessment 12 months after the surgery.
*p <. 05. **p <. 01.

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Table 2. Hierarchical Regression Analyses predicting Appearance Evaluation One Year after the Breast Surgery (T4)

Variables	*b*	*SE*	R^2 Adjusted	ΔR^2	Bootstrap 95% CI
Constant AET1	3.32**	0.05			[3.22, 3.42]
	0.49**	0.07			[0.34, 0.65]
BAST4	0.84**	0.15	.41**		[0.52, 1.16]
AET1 x BAST4	0.78**	0.20	.49	.08**	[0.36, 1.19]

Note. BAS = Body Appreciation Scale; AE = Appearance Evaluation; T1 = Assessment before surgery; T4 = Assessment at 12 months after surgery.
**p <. 001.

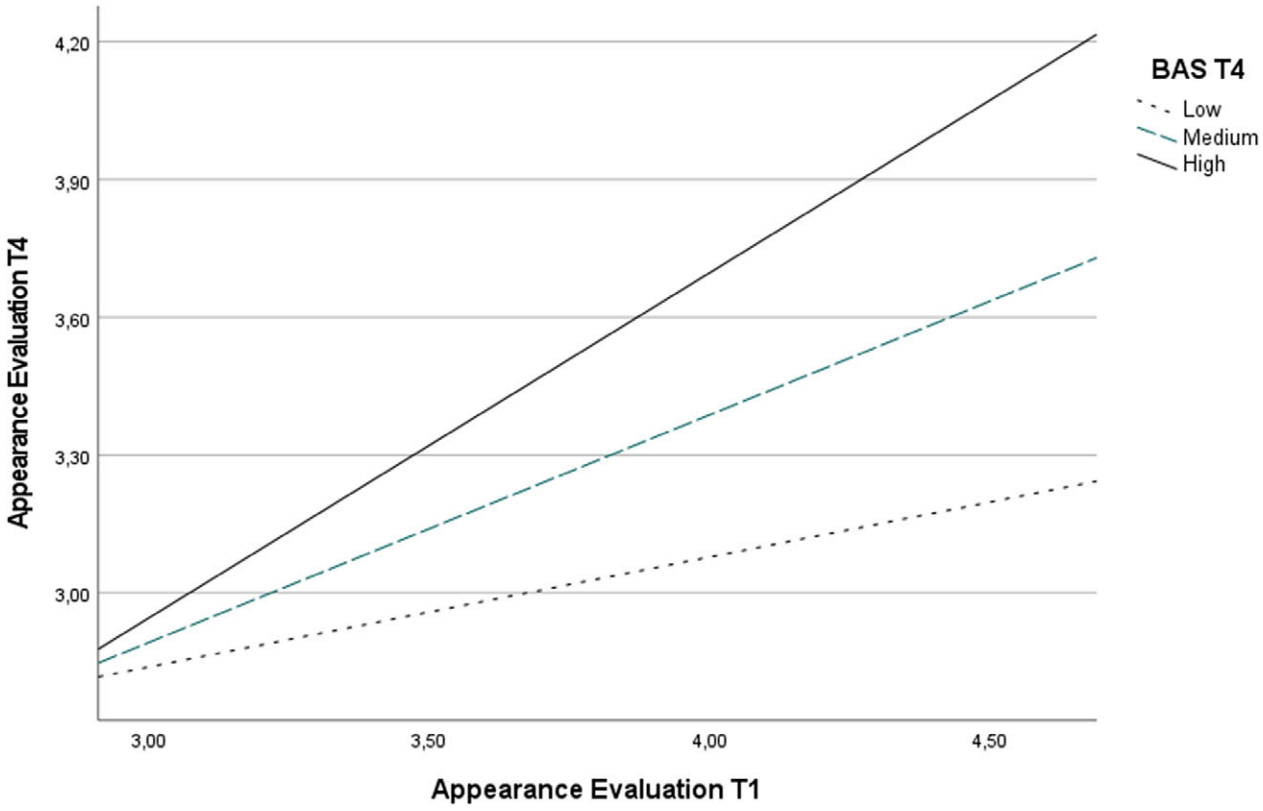

Figure 1. Body Appreciation Level Moderated the Association between the Appearance Evaluation Before the Surgery and the Appearance Evaluation at 12 Months' Follow-up After the Surgery.
Note. BAS = Body Appreciation; T1 = Assessment before the surgery; T4 = Assessment at 12 months' follow-up after the surgery.

(r = .64; p < .01), and there was a low and positive correlation with Body Appreciation at T4 and Appearance Evaluation at T4 (r = .18; p < .05). Moreover, Body Appreciation at T4 was high and negatively associated with BSI–18 at T4 (r = –.53; p < .001). Finally, the BSI–18 at T1 was low and positively associated with BSI–18 at T4 (r = .19; p < .05). The rest of the associations can be seen in Table 1.

As Table 2 shows, Body Appreciation at T4 moderated the association between the Appearance Evaluation before the surgery at T1 and the Appearance Evaluation at T4 12 months after the surgery. After the Appearance Evaluation at T1 was entered, Body Appreciation at T4 predicted the Appearance Evaluation at T4, both in addition to the Appearance Evaluation at T1 and when interacting with the Appearance Evaluation at T1, thus supporting a moderating impact of Body Appreciation at T4 in the association between Appearance Evaluation at T1 and Appearance Evaluation at T4 (R^2 =. 50, F(3, 93) = 30.14 p <. 001). Figure 1 shows that, in patients with higher levels of Body Appreciation, increased Appearance Evaluation at T1 corresponded to higher increases in the Appearance Evaluation at T4 than in the patients with low Body Appreciation.

In the second regression analysis (Table 3), we can see that both the Brief Symptoms Inventory at T1 and Body Appreciation at T4 predicted the Brief Symptoms Inventory at T4 (R^2 =. 29, F(3, 92) = 24.24 p <. 001). However, the Brief Symptoms Inventory at T1, when interacting with Body Appreciation at T4, did not add significant predictive variance to the regression model. Therefore, it did not support a moderating impact of Body Appreciation at T4 in the association between the Brief Symptoms Inventory at T1 and at T4. Figure 2 shows that, in patients with higher levels of Body Appreciation at T4, it increases in the Brief Symptoms Inventory at T1 corresponded to similar increases in the Brief Symptoms Inventory at T4 to those found in the patients with low Body Appreciation at T4.

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Table 3. Hierarchical Regression Analyses Predicting Distress One-year after the Breast Surgery

Variables	*b*	*SE*	R^2 Adjusted	ΔR^2	Bootstrap 95% CI
Constant	49.11**	10.61			[28.02, 70.19]
BSI T1	0.49*	0.75			[1.98, 1.01]
BAS T4	10.89**	2.69	.30**		[–16.24, –1.16]
BSIT1x BAST4	0.14	0.19	.30	.01	[–23,. 52]

Note. BSI = Brief Symptoms Inventory–18; BAS = Body Appreciation Scale; T1 = Assessment before surgery; T4 = Assessment at 12 months after surgery.
*p <. 05. **p <. 01.

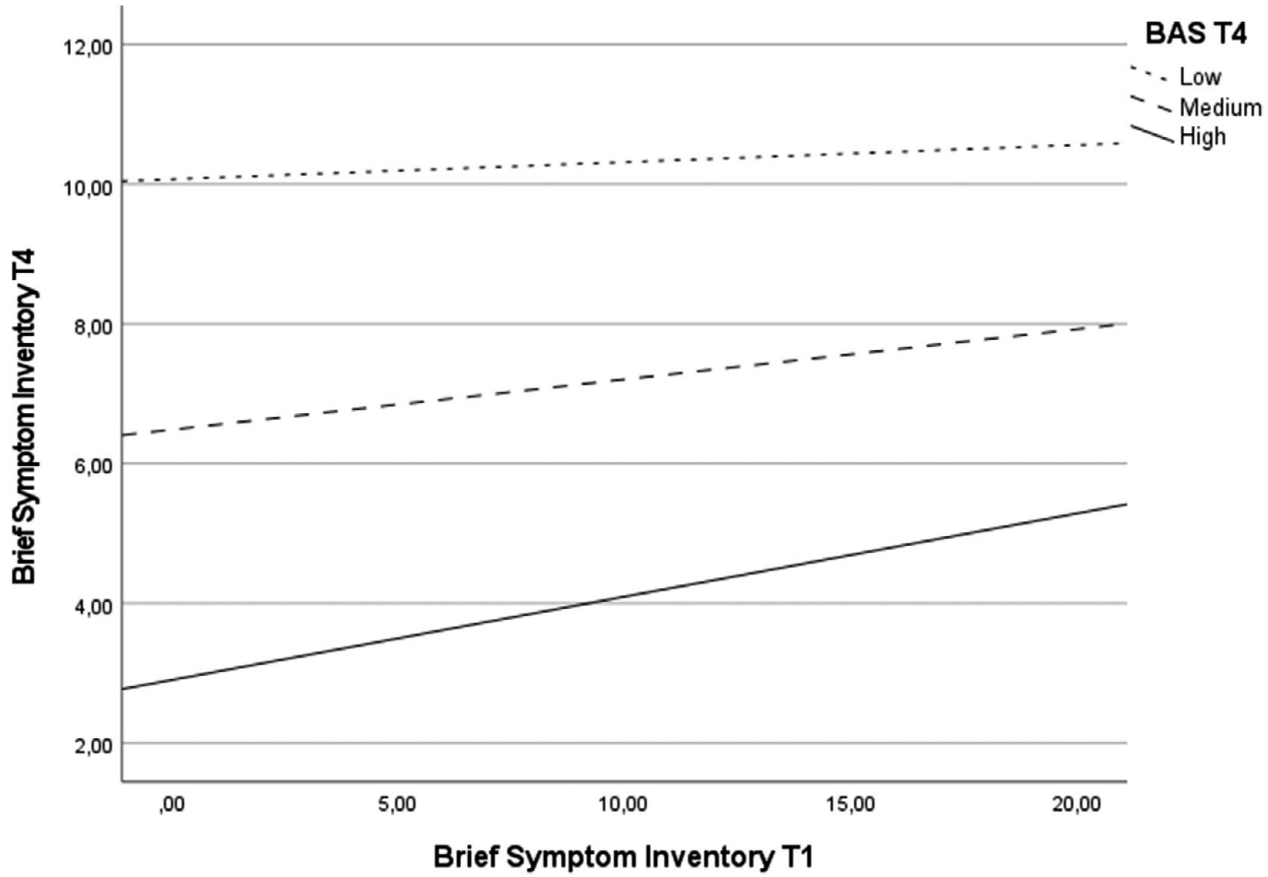

Figure 2. Body Appreciation Did Not Moderate the Association between the Distress Before the Surgery and the Distress at 12 Months' Follow-up After the Surgery
Note. BAS = Body Appreciation; T1 = Assessment before the surgery; T4 = Assessment at 12 months' follow-up after the surgery.

Potential multicollinearity between the predicting variables was rejected because the values for tolerance and the variance inflation factor (VIF) ranged between 0.51 and 0.99 and between 1.01 and 1.03, respectively, which meets requirements described in the literature (O'Brien, 2007).

Discussion

The aims of this study were to analyze whether body appreciation at T4 was a moderator of feelings of physical attractiveness from the moment before the breast surgery to the one-year follow-up, and whether body appreciation at T4 was a moderator of distress from the moment before the breast surgery to the one-year follow-up.

The results revealed that Body Appreciation at T4 moderated the association between the Appearance Evaluation at T1 before the surgery and the Appearance Evaluation at T4 12 months after the surgery. Therefore, greater unconditional acceptance of the body, despite all the imperfections caused by surgery and treatment, was a predictor of a more positive attitude towards the body, positive feelings, and satisfaction with body areas from the moment before breast surgery to the one-year follow-up. Thus, the first research hypothesis was confirmed. Our results are consistent with other authors who found that body appreciation, despite the changes that occur during the cancer treatment, was a predictor of satisfaction with the overall appearance and satisfaction with body areas (Ávalos et al., 2005; Linardon et al., 2023; Tylka, 2012).

Regarding the second aim, the results suggested that Body Appreciation at T4 was a predictor of distress at T4. However, Body Appreciation at T4 was not a moderator of distress from the

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moment before breast surgery to the one-year follow-up. Thus, the second hypothesis was not confirmed. Although distress and body appreciation were negatively related, review studies indicated that body image dissatisfaction was not one of the main sources of distress in people with breast cancer. The main sources of stress were menopausal symptoms, pain, sleep disturbance, lymphedema, breast symptoms, diarrhea, dyspnea, treatment related complaints, a higher number of comorbidities, and a history of mental health disorders (Syrowatka et al., 2017). Thus, it is possible that all these variables indirectly influence the association between distress during breast cancer treatment and body appreciation.

This study highlights the importance of evaluating the construct of body appreciation in participants with breast cancer using longitudinal designs. Our results showed that body appreciation, body dissatisfaction, and distress before the surgery were associated with body appreciation, body dissatisfaction, and distress at the twelve-month follow-up. Thus, the present study emphasizes the need to perform longitudinal and multidimensional assessments of body image that focus on the effects of surgery in cancer participants (Davis et al., 2020). Moreover, our study evolves a holistic conceptualization of body image that confirms that negative and positive body images are different constructs with different predictors and outcomes (Brunet et al., 2022).

In addition, our results suggest the importance of developing psychological interventions for women survivors of breast cancer that focus on increasing body appreciation: Increasing acceptance of the body, attending to bodily needs, learning to enjoy the body as it is, discovering all the potential of the body, and reducing thoughts and behaviors related to a negative body image (Duijts et al., 2011; Nye & Cash, 2006; Sebri et al., 2021). Previous studies have shown that different psychotherapies have been effective in improving body image in people with breast cancer. For example, recently the Restoring Body Image after Cancer group program, which includes expressive exercises and guided imagery, was found to be effective in improving body dissatisfaction and quality of life in women breast cancer survivors (Grossert et al., 2023). It is an experiential and holistic psychotherapy that helps patients to cope with unwanted sensations and feelings related to their external appearance and attitudes toward their body such as feelings of insecurity, stigmatization, impaired functioning, and disconnectedness from their body (Grossert et al., 2023).

However, our results suggest that, in addition to intervening in body appreciation, it might be necessary to carry out an intervention focused on improving distress in women with breast cancer. Fortunately, there are effective psychotherapies to reduce distress and improve quality of life in women with breast cancer (Jassim et al., 2023). Thus, future research should analyze whether a psychotherapy consisting of an intervention aimed at improving body appreciation combined with an intervention aimed at reducing distress in women with breast cancer could be more effective than psychotherapies that focus only on improving distress.

One strength of this study is that it is longitudinal, controlling the evaluation of the psychological state of the participants at three, eight, and twelve months after the surgery, as recommended in the literature (Pérez et al., 2015). Likewise, standardized and validated multidimensional measures were used in the Spanish population and showed optimal reliability in our sample, and the assessment interviews were conducted face to face with mental health specialists. In addition, the sample size was adequate, and the inclusion criteria were quite broad. Therefore, it is reasonable to assume that the sample is representative of the patients seen in routine clinical practice.

The main limitation of this study is the sample size. Although at Time 1 $n = 115$ participants were recruited, at the end of the treatment, this number had been reduced to 73 participants, 65% of the initial sample. This reduction was due to several factors described previously, such as not having reached the time of the next evaluation, receiving follow-up by a different department at the same hospital, or death. Thus, with a larger sample, we might have found more consistent results than those found in the present study. Another limitation of our study is that we were not able to assess other medical variables or include more information, such as pain levels. These levels could potentially be a variable that influences body appreciation. Furthermore, although the reliability in our sample was adequate, we used the Spanish adaptation of the BAS for the adolescent population without cancer (Jáuregui Lobera & Bolaños Ríos, 2011). Finally, another limitation was that the type of cancer therapy received after surgery (chemotherapy vs. radiotherapy) was not controlled for in the statistical analyses. Thus, future research should carry out longitudinal studies in which the moderating role of body appreciation is evaluated with a larger sample, controlling other variables such as the participant's level of pain or the type of cancer therapy received after surgery (chemotherapy vs. radiotherapy) using ecological momentary assessment.

The body appreciation is a moderator of women's satisfaction with the changes produced in the body during the entire breast cancer treatment.

Authorship credit. J. H. Marco conceptualized the study. J. Castejon and F. Ripoll recruited the sample and carried out the assessments. J.H. Marco, J. Castejon and L. Grau contributed to statistical methodologies, as well as conceptualizing the presentation of the results. All the authors reviewed and edited the manuscript.

Data sharing. Data are not available due to confidentiality.

Conflicts of interest. None.

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