

Validation of the body acceptance scale for women with breast cancer in a Turkish sample

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Abstract

Aim This study aimed to adapt the Body Acceptance Scale for Women with Breast Cancer (BAS-BC) into Turkish and evaluate its psychometric properties among Turkish women who had undergone surgery for breast cancer.

Methods This methodological and cross-sectional study was conducted between April 2024 and May 2025 in the Department of General Surgery of a hospital. The sample consisted of 136 women who had undergone surgical treatment for breast cancer. Linguistic validity, content validity, construct validity, and reliability were assessed. Construct validity was evaluated using exploratory and confirmatory factor analyses. Internal consistency was examined using Cronbach's alpha, composite reliability (CR) was calculated as a reliability indicator, and average variance extracted (AVE) was calculated to assess convergent validity.

Results Exploratory factor analysis revealed a modified five-factor structure that retained all 17 items of the original six-factor BAS-BC explaining 78.97% of the total variance. In the Turkish version, the original "Encounter" and "Adaptation" subdimensions merged into a single factor named "Encounter and Adaptation to the Body." Confirmatory factor analysis showed mixed model fit indices: chi-square/degrees of freedom ratio (χ^2/df)=2.69, root mean square error of approximation (RMSEA)=0.112, comparative fit index (CFI)=0.91, and Tucker–Lewis index (TLI)=0.89. Therefore, the confirmatory findings were interpreted cautiously. Cronbach's alpha coefficients ranged from 0.71 to 0.92, and the overall internal consistency coefficient was 0.897. Composite reliability values exceeded 0.70 for all subdimensions, whereas average variance extracted values exceeded 0.50 for four of the five subdimensions.

Conclusions The Turkish version of the Body Acceptance Scale for Women with Breast Cancer demonstrated acceptable preliminary psychometric properties while retaining all 17 items and exhibiting a modified five-factor structure compared with the original six-factor structure. However, because exploratory and confirmatory factor analyses were conducted in the same sample and the RMSEA value indicated suboptimal fit, further validation in larger and independent samples is recommended.

Keywords Body image · Body acceptance · Breast cancer · Nursing practice · BAS-BC · Reliability · Validity · Women · Turkey

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Introduction

Breast cancer is the most common malignancy among women worldwide and has multidimensional physical, psychological, and social consequences [1]. Treatment processes such as surgery, chemotherapy, radiotherapy, and hormonal therapy may lead to significant changes in women's bodily integrity. These changes affect not only physical appearance but also identity-related dimensions such as femininity, motherhood, and sexuality [2, 3]. The loss or alteration of the body may result in impaired self-perception, decreased self-confidence, depression, anxiety, and reduced quality of life [4, 5].

In this context, the concept of body acceptance has gained increasing attention in recent years as part of the process of coping with physical changes after breast cancer. In their conceptual analysis using a hybrid model approach, Ahn and Suh defined body acceptance as "the process of recognising, normalising, and coping with physical changes resulting from breast cancer and its treatment." This concept refers not only to accepting physical changes but also to maintaining a life in harmony with the changed body, rebuilding psychological integrity, and developing a positive outlook for the future [2, 3].

Body acceptance differs from body image in that it emphasizes a positive adaptation process rather than focusing primarily on negative perceptions of appearance. However, the literature indicates that valid and reliable measurement tools capable of comprehensively assessing this concept are limited. Similarly, a qualitative validation study by Effa et al. found that the widely used Body Image Scale does not adequately reflect the positive attitudes, adaptation experiences, and meaning-making processes of women after breast cancer [6]. Therefore, there is a need for measurement tools that can specifically evaluate body acceptance as a multidimensional and adaptive process.

To address this gap, Ahn and Suh developed the Body Acceptance Scale for Women with Breast Cancer as the first original measure designed to assess body acceptance in women diagnosed with breast cancer in a multidimensional manner [7]. The scale consists of 17 items and six subdimensions: "encounter," "understanding," "adaptation," "return to daily life," "successful transition," and "leap into the future." The original scale demonstrated a reliable psychometric structure with high internal consistency and construct validity [7].

However, body image and body acceptance are not merely individual psychological phenomena; they are also shaped by social, cultural, and religious dynamics. The Body Image Self-Rating Questionnaire for Breast Cancer, developed by Zhou et al. specifically for Chinese culture, emphasizes the decisive influence of cultural context on body perception [8]. Similarly, qualitative studies conducted with Turkish samples have shown that religious beliefs, social roles, and family structure are important factors in women's processes of making sense of their bodies after mastectomy [4]. Therefore, measurement tools that do not take cultural differences into account may be insufficient to fully reflect the meaning of body acceptance in different cultural contexts.

Therefore, this study aimed to adapt the Body Acceptance Scale for Women with Breast Cancer (BAS-BC) into Turkish and evaluate its psychometric properties among Turkish women who had undergone surgery for breast cancer. The study addressed the following research questions: [1] Does the Turkish version of the BAS-BC demonstrate an interpretable factor structure and adequate construct validity [2]? Does the Turkish version of the BAS-BC demonstrate adequate reliability? It was hypothesized that the factor structure of the BAS-BC would be supported by exploratory and confirmatory factor analyses and that the scale would demonstrate acceptable validity and reliability indices in Turkish women with breast cancer.

Methods

Research design

This methodological and cross-sectional study was conducted to adapt the Body Acceptance Scale for Women with Breast Cancer into Turkish and to evaluate its psychometric properties. The study was carried out between April 2024 and May 2025 with women who had undergone surgical treatment for breast cancer.

The validity and reliability analyses of the scale were conducted in accordance with internationally accepted psychometric principles. The psychometric evaluation process was guided by the COSMIN (COnsensus-based Standards for the selection of health Measurement Instruments) recommendations, with particular emphasis on structural validity and internal consistency [9]. The cultural adaptation process was performed based on the steps proposed by Beaton et al. [10]. Accordingly, forward translation, back translation, expert review, and pilot testing were conducted to ensure linguistic and cultural equivalence.

Research objective

The aim of this study was to adapt the Body Acceptance Scale for Women with Breast Cancer, developed by Ahn and Suh [7], into Turkish and to evaluate its validity and reliability among Turkish women who had undergone surgery for breast cancer. The Turkish version of the scale is expected to provide a culturally appropriate measurement tool for assessing women's body acceptance and adaptation processes after breast cancer. The psychometric evaluation was guided by separate hypotheses for validity and reliability. For validity, it was hypothesized that exploratory factor analysis would identify an interpretable multidimensional factor structure and that confirmatory factor analysis would provide support for the factor structure identified through exploratory factor analysis. For reliability, it was hypothesized that the Turkish BAS-BC would demonstrate adequate internal consistency, as indicated by Cronbach's alpha coefficients and corrected item-total correlations, as well as adequate composite reliability.

Research setting and time

The study was conducted between April 2024 and May 2025 in the Department of General Surgery at İnönü University Turgut Özal Medical Centre. Participants were women who had undergone surgical treatment for breast cancer and presented to the relevant clinic during the study period.

Population and sample

The study population consisted of women who had undergone breast cancer surgery and presented to the Department of General Surgery at İnönü University Turgut Özal Medical Centre during the study period.

A consecutive sampling method was used. Women who attended the General Surgery outpatient clinic for routine follow-up after breast cancer surgery during the study period were screened for eligibility based on the inclusion criteria. Eligible women were approached face-to-face in the outpatient clinic waiting area. The purpose and procedures of the study were explained by the researcher, and women who met the eligibility criteria and voluntarily agreed to participate were consecutively enrolled in the study until the required sample size was reached.

In scale adaptation studies, it is commonly recommended that the sample size should be at least 5–10 times the number of scale items [11]. Since the original scale consists of 17 items, the required sample size was estimated to range between 85 and 170 participants. The study was completed with 136 women who met the inclusion criteria and agreed to participate. According to Comrey and Lee's classification for factor analysis, a sample size between 100 and 200 can be considered acceptable [12]. Therefore, the sample size was considered adequate for preliminary psychometric evaluation.

Due to the limited sample size, exploratory factor analysis and confirmatory factor analysis were conducted using the same dataset. This approach was acknowledged as a methodological limitation, and the confirmatory factor analysis findings were interpreted as preliminary evidence requiring further validation in larger and independent samples.

The inclusion criteria were as follows: being 18 years of age or older, being aware of their breast cancer diagnosis, having undergone surgery such as breast-conserving surgery or mastectomy after a diagnosis of breast cancer, being literate, being able to communicate in Turkish, and voluntarily agreeing to participate in the study. The exclusion criteria were as follows: having a diagnosis of breast cancer without surgical treatment, having a diagnosed mental disorder within the past six months or using medication for such a condition, refusing to participate in the study, or submitting an incomplete questionnaire.

Data collection tools

Data were collected by the researchers through face-to-face interviews. Two data collection tools were used: the Personal Information Form and the Body Acceptance Scale for Women with Breast Cancer.

Personal information form

The Personal Information Form was prepared by the researchers in line with the literature.² The form consisted of 12 questions assessing participants' sociodemographic characteristics, including age, educational status, marital status, income level, employment status, family type, number of children, and menopausal status, as well as clinical characteristics, including side of breast surgery, type of surgery, cancer stage, and lymphedema status.

Body acceptance scale for women with breast cancer

The Body Acceptance Scale for Women with Breast Cancer was developed by Ahn and Suh to assess body acceptance levels in women diagnosed with breast cancer [7]. The scale consists of 17 items and six subscales: Encounter, Understanding, Adaptation, Return to Daily Life, Successful Transition, and Leap into the Future.

The subscales and corresponding items are as follows: Encounter, items 1, 7, and 13; Understanding, items 2, 8, and 14; Adaptation, items 3, 9, and 15; Return to Daily Life, items 4, 10, and 16; Successful Transition, items 5, 11, and 17; and Leap into the Future, items 6 and 12. The scale is rated on a five-point Likert scale ranging from 1, strongly disagree, to 5, strongly agree. Items 1, 3, 5, 10, 13, and 15 are reverse-coded. Higher total scores indicate higher levels of body acceptance. In the original study, Cronbach's alpha coefficient for the scale was reported as 0.95 [7].

Cultural adaptation stages of the scale

The cultural adaptation process of the scale was conducted in accordance with internationally accepted validity and reliability principles [10, 13]. The adaptation process consisted of three main stages: linguistic validity, content validity, and pilot testing.

Linguistic validity

In the first stage of the adaptation process, permission to use the original English version of the scale was obtained from the authors who developed the instrument [7]. The scale was then independently translated into Turkish by two sworn translators. The two translations were compared by the research team in terms of semantic equivalence, cultural appropriateness, and linguistic clarity, and the most suitable Turkish expressions were selected to create a common draft version. The Turkish draft version was then back-translated into English by two independent

language experts who had not seen the original scale. The back-translated version was compared with the original English version to evaluate conceptual and semantic equivalence. This process was conducted to support the linguistic validity of the Turkish form.

Content validity

After the linguistic validity process was completed, the content validity of the scale was evaluated. The Turkish draft version of the scale, the original English version, and the Content Validity Assessment Form were sent via email to 11 academics specializing in women's health nursing, surgical nursing, and psychiatric nursing.

The experts rated each item using a four-point scale: 1 = appropriate, 2 = needs minor revision, 3 = needs major revision, and 4 = not appropriate. In accordance with the direction of the rating scale used in this study, ratings of 1 and 2 were classified as content-valid and ratings of 3 and 4 as not content-valid. The Item-level Content Validity Index (I-CVI) was calculated as the proportion of experts rating each item as content-valid, and the Scale-level Content Validity Index using the averaging method (S-CVI/Ave) was calculated as the mean of the I-CVI values, following the methodological approach described by Polit and Beck [13]. In addition to the quantitative content validity assessment, qualitative content validity was evaluated by obtaining experts' comments and suggestions regarding the clarity, comprehensibility, wording, and appropriateness of the items. The research team reviewed these recommendations, and the Turkish version of the scale was finalized accordingly.

Pilot testing

After establishing content validity, a pilot study was conducted with 10 women who had undergone surgery for breast cancer and met the eligibility criteria. As part of the pilot study, face validity was assessed by asking the participants to evaluate the scale items in terms of meaning, clarity, and comprehensibility. The 10 women who participated in the pilot study were subsequently included in the main study sample.

Data collection

Data were collected from women who had undergone surgery for breast cancer and presented to the Department of General Surgery at İnönü University Turgut Özal Medical Centre between April 2024 and May 2025. Data collection was conducted through face-to-face interviews. Before data collection, the purpose and scope of the study were explained to each participant, and verbal informed consent was obtained from those who agreed to participate.

It took approximately 10–12 min for participants to complete the data collection forms. Data were collected using the Personal Information Form and the Turkish version of the Body Acceptance Scale for Women with Breast Cancer.

Statistical analysis

Data analysis was performed using IBM SPSS Statistics 25.0 and AMOS 24.0 software packages. A significance level of $p < 0.05$ was accepted for all analyses.

Descriptive analyses

Descriptive statistics were used to summarize participants' sociodemographic and clinical characteristics. Categorical variables were presented as numbers and percentages, while continuous variables were presented as means, standard deviations, minimum values, and maximum values.

Validity analyses

Content validity was evaluated using the Content Validity Index based on expert opinions. The suitability of the dataset for factor analysis was assessed using the Kaiser–Meyer–Olkin coefficient and Bartlett’s test of sphericity. Construct validity was examined using principal component analysis (PCA) and confirmatory factor analysis (CFA). In the PCA, component retention was evaluated by considering eigenvalues, scree plot inspection, theoretical interpretability, and consistency with the structure of the original scale. Component loadings, eigenvalues, explained variance, and corrected item-total correlations were examined. CFA was conducted to test the factor structure obtained from the exploratory factor analysis. Model fit was evaluated using the chi-square/degrees of freedom ratio (χ^2/df), root mean square error of approximation (RMSEA), comparative fit index (CFI), Tucker–Lewis index (TLI), goodness of fit index (GFI), adjusted goodness of fit index (AGFI), and standardized root mean square residual (SRMR). According to the criteria proposed by Schermelleh-Engel et al. [14], χ^2/df values between 2 and 3, RMSEA values between 0.05 and 0.08, CFI and TLI values between 0.95 and 0.97, GFI values between 0.90 and 0.95, AGFI values between 0.85 and 0.90, and SRMR values between 0.05 and 0.10 were considered indicative of acceptable model fit. The root mean square error of approximation value was interpreted together with its 90% confidence interval where available. Standardized factor loadings, residual variances, and squared multiple correlations were examined to evaluate the CFA solution. Because exploratory and confirmatory factor analyses were conducted using the same dataset due to the limited sample size, the confirmatory factor analysis findings were interpreted as preliminary evidence and evaluated cautiously. During confirmatory factor analysis, error covariances were added between the residual terms of items 1–3, 1–2, 2–3, and 9–16 based on modification indices and theoretical similarity in item content. These modifications were applied only when conceptual overlap between the items was considered justifiable.

Reliability analysis

The internal consistency of the scale was assessed using Cronbach’s alpha coefficient and corrected item-total correlations. Cronbach’s alpha if item deleted values were also examined to evaluate the contribution of each item to the reliability of the scale. Average variance extracted (AVE) and composite reliability (CR) were calculated using the standardized factor loadings obtained from the CFA model. AVE was used to assess convergent validity, with values ≥ 0.50 considered acceptable, whereas CR was used to assess composite reliability, with values ≥ 0.70 considered acceptable.

Ethical principles

The study was approved by the İnönü University Scientific Research and Publication Ethics Committee (Decision No: 2024/5738; Date: 16.04.2024), and institutional permission was obtained before data collection. Participants were informed about the study aim, procedures, and voluntary participation, and verbal informed consent was obtained from those who agreed to participate. The study was conducted in compliance with the Declaration of Helsinki.

Results

The mean age of the participants was 51.83 ± 8.97 years, and the mean number of children was 2.44 ± 1.57 . The highest proportion of participants were university graduates (32.4%), and most were unemployed (75.7%), married (83.1%), and living in nuclear families (93.4%). More than half of the women reported that their income was equal to their expenses (52.2%), and 69.1% were postmenopausal.

Regarding clinical characteristics, breast surgery was most commonly performed on the left side (45.6%). Regarding the type of surgery, most participants had undergone mastectomy-based surgery (91.2%), while 8.8% had undergone breast-conserving surgery. Of the participants, 41.2% had stage II breast cancer, and 72.8% did not develop postoperative lymphedema (Table 1).

The mean total BAS-BC score of the participants was 46.74 ± 10.72 .

The I-CVI values ranged from 0.91 to 1.00 across the 17 items, and the S-CVI/Ave for the overall scale was 0.99, supporting excellent content validity.

During face validity assessment, all 10 women considered the scale items clear and understandable, and no difficulties in understanding the items were reported. Therefore, no items were removed or revised following the pilot study, and the Turkish form proceeded to psychometric evaluation as a 17-item instrument.

Table 1 Sociodemographic and clinical characteristics of women with breast cancer ($n=136$)

Variables	<i>n</i>	%
Educational level		
Literate	11	8.1
Primary school	31	22.8
Secondary school	11	8.1
High school	39	28.7
University	44	32.4
Employment status		
Employed	33	24.3
Unemployed	103	75.7
Income level		
Income less than expenses	56	41.2
Income equal to expenses	71	52.2
Income greater than expenses	9	6.6
Family type		
Nuclear family	127	93.4
Extended family	9	6.6
Marital status		
Married	113	83.1
Unmarried	23	16.9
Menopausal status		
Yes	94	69.1
No	42	30.9
Side of breast surgery		
Right	51	37.5
Left	62	45.6
Bilateral	23	16.9
Type of surgery		
Mastectomy-based surgery	124	91.2
Breast-conserving surgery	12	8.8
Breast cancer stage		
Stage I	47	34.6
Stage II	56	41.2
Stage III	33	24.3
Postoperative lymphedema		
Yes	37	27.2
No	99	72.8

Age, mean $\pm$ SD = 51.83 ± 8.97 years, range = 27–78; number of children, mean $\pm$ SD = 2.44 ± 1.57 , range = 0–9

Table 2 Principal component analysis and corrected item-total correlations of the Turkish BAS-BC

Item	Item wording	F1	F2	F3	F4	F5	CITC
Q1	Following breast cancer surgery, I am reluctant to look at my naked body	0.799					0.704
Q7	I feel comfortable looking at my operated breast(s) or the surrounding area	0.750					0.585
Q13	I am reluctant to touch my operated breast(s) or the surrounding area	0.839					0.639
Q3	I feel uncomfortable with my operated breast(s) post-surgery	0.732					0.787
Q9	I often forget the fact that I had cancer surgery on my breast(s)	0.729					0.729
Q15	Physical symptoms (pain, fatigue, etc.) after breast cancer treatment continue to bother me	0.742					0.766
Q2	I am fortunate that the changes in my appearance (due to breast cancer treatment) are to this extent		0.943				0.288
Q8	Despite breast cancer, I am fortunate that my health status is at this level		0.891				0.486
Q14	Despite breast cancer, I am fortunate that my physical symptoms (pain, fatigue, etc.) are to this extent		0.806				0.355
Q10	I feel that my daily life changed because my health condition is not as good as before			0.822			0.265
Q16	I can do activities I enjoyed before my breast cancer diagnosis without difficulties			0.766			0.331
Q4	I feel like I have resumed my daily life as it was before my breast cancer diagnosis			0.609			0.416
Q5	After breast cancer surgery, I am reluctant to be in places where body exposure is expected (public baths, swimming pools, changing rooms, etc.)				0.739		0.701
Q11	I am satisfied with my current physical appearance after breast cancer surgery				0.870		0.647
Q17	Although I had breast cancer surgery, my physical appearance is intact				0.937		0.594
Q6	I think my health will improve in the future					0.684	0.550
Q12	I think that my physical symptoms (pain, fatigue, etc.) due to breast cancer treatment will get better					0.836	0.397
Eigenvalue		6.695	2.312	1.909	1.328	1.181	
Variance (%)		39.380	13.599	11.232	7.812	6.946	
Cumulative variance (%)		39.380	52.979	64.211	72.023	78.969	
Cronbach's alpha		0.920	0.875	0.712	0.895	0.802	0.897*

KMO Kaiser–Meyer–Olkin, CITC Corrected item-total correlation, BAS-BC Body Acceptance Scale for Women with Breast Cancer

KMO=0.748; Bartlett's test of sphericity: $\chi^2 = 2104.048$, $p < 0.001$. Extraction method: principal component analysis; rotation method: Direct Oblimin. Total Cronbach's alpha

As shown in Table 2, the Kaiser–Meyer–Olkin value was 0.748, and Bartlett's test of sphericity was significant, $\chi^2 = 2104.048$, $p < 0.001$, indicating that the dataset was suitable for factor analysis. Exploratory factor analysis of the Turkish version of the scale yielded a five-factor structure with eigenvalues greater than 1. Principal component analysis (PCA) with Direct Oblimin rotation yielded a five-component solution with eigenvalues greater than 1. Component loadings ranged from 0.609 to 0.943, and the five components together explained 78.97% of the total variance. Although the original scale consisted of 17 items across six subdimensions, all 17 items were retained in the Turkish version; however, a modified five-factor structure emerged because the Encounter and Adaptation dimensions were grouped under a single factor. This factor was named “Encounter and Adaptation to the Body.” The five factors were named as follows: Encounter and Adaptation to the Body, Understanding, Return to Daily Life, Successful Transition, and Leap into the Future.

Cronbach's alpha coefficients for the factors ranged from 0.712 to 0.920, and the overall Cronbach's alpha coefficient was 0.897. Corrected item-total correlation values ranged from 0.265 to 0.787. These findings supported the internal consistency of the Turkish version of the scale.

Confirmatory factor analysis was conducted to evaluate the modified five-factor structure obtained from the exploratory factor analysis. During the confirmatory factor analysis, theoretically justifiable error covariances were added between the residual terms of items 1–3, 1–2, 2–3, and 9–16 based on modification indices and item content similarity. After these modifications, the fit indices of the model were as follows: $\chi^2/df=2.693$, RMSEA=0.112, GFI=0.812, AGFI=0.726, CFI=0.914, TLI=0.889, and SRMR=0.0867 (Fig. 1). The χ^2/df and SRMR values were within the acceptable ranges according to the predefined criteria. However, the RMSEA, CFI, TLI, GFI, and AGFI values did not meet the recommended thresholds. Therefore, the overall model fit was considered mixed, and the CFA findings were interpreted cautiously as preliminary evidence.

The standardized factor loadings shown in the CFA model ranged from 0.46 to 1.07. Standardized loadings slightly exceeding 1.00 were observed for Q3 (1.003) and Q6 (1.068), accompanied by small negative residual

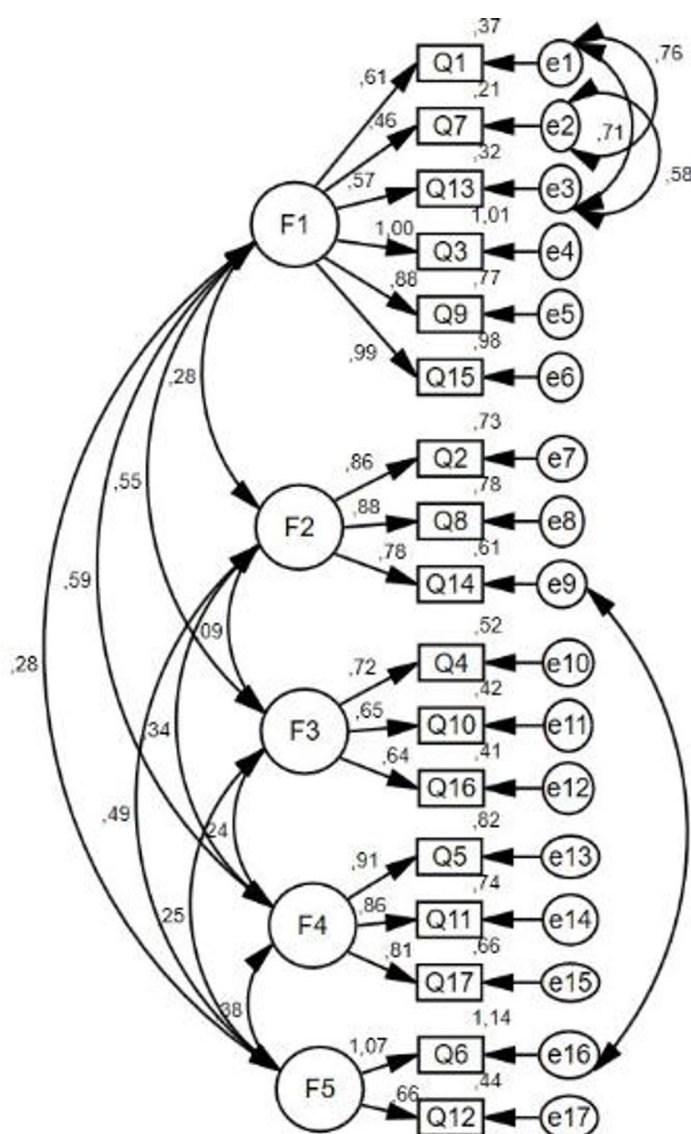


Fig. 1 Confirmatory factor analysis model of the Turkish version of the body acceptance scale for women with breast cancer. Values represent standardized estimates. Error covariances were added between items 1–3, 1–2, 2–3, and 9–16 based on modification indices and item content similarity

Table 3 Average variance extracted and composite reliability values based on standardized CFA loadings of the Turkish BAS-BC

Subscale	AVE	CR
Encounter and Adaptation to the Body	0.609	0.896
Understanding	0.709	0.879
Return to Daily Life	0.452	0.712
Successful Transition	0.741	0.896
Leap into the Future	0.788	0.876

AVE and CR values were calculated using standardized factor loadings obtained from the CFA model

AVE Average variance extracted, CR Composite reliability, CFA Confirmatory factor analysis, BAS-BC Body Acceptance Scale for Women with Breast Cancer

variance estimates. Therefore, these estimates were interpreted cautiously. Inter-factor correlations ranged from 0.09 to 0.59, indicating that the subdimensions were related but not redundant. Overall, the CFA findings provided preliminary support for the modified five-factor structure of the Turkish version of the scale.

Average variance extracted (AVE) and composite reliability (CR) were calculated using the standardized factor loadings obtained from the CFA model. AVE was used to assess convergent validity, with values ≥ 0.50 considered acceptable, whereas CR was used to assess composite reliability, with values ≥ 0.70 considered acceptable. AVE values ranged from 0.452 to 0.788. AVE exceeded the recommended threshold of 0.50 for four of the five subdimensions; however, the Return to Daily Life subdimension had an AVE of 0.452, indicating that convergent validity was not fully supported for this subdimension (Table 3).

Composite reliability values ranged from 0.712 to 0.896. All subdimensions exceeded the recommended threshold of 0.70, indicating adequate composite reliability. These estimates were interpreted in conjunction with the estimation instability observed in the CFA model.

Discussion

This study was conducted to evaluate the validity and reliability of the Body Acceptance Scale for Women with Breast Cancer, developed by Ahn and Suh [7], after adapting it into Turkish culture. The findings provided preliminary evidence that the Turkish version of the scale has acceptable psychometric properties. Although all 17 items of the original BAS-BC were retained, the Turkish version demonstrated a modified five-factor structure rather than the original six-factor structure. This difference may be associated with the way Turkish women experience bodily confrontation and adaptation after breast cancer within a shared psychosocial and cultural context.

Factor structure and cultural adaptation

As a result of exploratory factor analysis, a modified five-factor structure with eigenvalues above 1 explained 78.97% of the total variance. In the Turkish form, the original “Encounter” and “Adaptation” dimensions were grouped under a single factor. This may indicate that Turkish women experience the processes of confronting physical change and adapting to the changed body as closely related and overlapping psychosocial processes.

In Turkish culture, the body is not merely a physical entity; it may also be associated with womanhood, motherhood, social identity, and spiritual integrity. Therefore, bodily change after breast cancer may be interpreted not only as a loss but also as part of a process of reintegration and psychosocial adjustment. Similarly, Aksoy Can et al. [15] examined body perception and self-esteem among Turkish women who had undergone total abdominal hysterectomy with bilateral salpingo-oophorectomy. Their findings demonstrated the relevance of body perception and self-esteem in the context of surgery involving changes to women’s reproductive organs.

These findings support the importance of considering the psychosocial dimensions of bodily changes experienced by women following surgery. Erturhan Türk and Yılmaz [16] reported that women's quality of life declined as body image deteriorated after mastectomy, but that a supportive environment and psychosocial adjustment positively influenced this process. Furthermore, Konara Mudiyansele et al. [17] demonstrated that body image changes dynamically over time following breast cancer surgery, with different longitudinal patterns observed among women undergoing mastectomy and breast reconstruction. Taken together, these findings provide a contextual basis for interpreting “encountering the body” and “adaptation” as potentially interconnected processes in the factor structure of the Turkish version.

Theoretical context: Roy Adaptation Model

The five-factor structure obtained in this study can also be interpreted within the framework of Roy's Adaptation Model. According to Roy [18], individuals develop adaptive responses to environmental changes through physiological, self-concept, role function, and interdependence modes. The physical changes experienced by women after breast cancer and surgical treatment may threaten the self-concept mode by affecting body integrity, femininity, and self-perception. In this study, the combination of the “Encounter and Adaptation to the Body” factor may be interpreted as an adaptive response within the self-concept mode described in Roy's Adaptation Model.

For Turkish women, the meaning of the body may involve not only physical but also spiritual and social reconstruction. In Turkey, the body is considered an indicator of cultural and class identity [19]. In Dural's qualitative study examining the experiences of women with breast cancer receiving chemotherapy, women reported physical and emotional difficulties as well as changes in their daily lives, including negative changes in body image associated with breast removal, hair loss, and weight loss. Despite these challenges, women continued their treatment and employed various strategies to manage treatment-related symptoms [20]. These findings may be interpreted within the framework of Roy's Adaptation Model, which emphasizes adaptive responses to internal and external stimuli.

Psychometric evaluation

The CFA findings obtained in this study provided preliminary support for the modified five-factor structure of the Turkish version of the scale. The factor loadings were generally within an acceptable range; however, the CFA results should be interpreted cautiously due to mixed model fit indices. In addition, the correlations between sub-dimensions ranged from 0.09 to 0.59, indicating that the dimensions were theoretically related but not redundant. These findings suggest that the multidimensional structure of the scale was partially supported in the Turkish sample.

The confirmatory factor analysis showed mixed model fit. The χ^2/df and SRMR values were within acceptable ranges; however, the RMSEA, CFI, TLI, GFI, and AGFI values did not meet the recommended thresholds. Therefore, the present findings should not be interpreted as indicating satisfactory overall model fit. The CFA findings should be considered preliminary and should be confirmed in larger and independent samples. Although RMSEA values may be affected by sample size, model complexity, and degrees of freedom [21–23], the present findings should not be interpreted as indicating fully satisfactory model fit.

Cronbach's alpha coefficients ranging from 0.71 to 0.92 and the total reliability coefficient of 0.90 indicated that the scale had satisfactory internal consistency. Furthermore, CR values exceeded 0.70 for all subscales, supporting composite reliability. AVE values exceeded 0.50 for four of the five subscales, whereas the Return to Daily Life subscale had an AVE of 0.452. Thus, convergent validity was supported for most, but not all, subscales. These findings should be interpreted cautiously given the estimation instability observed in the CFA model [24]. Overall, the findings indicate that the Turkish version of the scale has acceptable preliminary psychometric properties; however, further studies are needed to strengthen the evidence for its construct validity and temporal stability.

Cultural and clinical interpretation

Body acceptance in Turkish women may be considered not only an aesthetic or physical adjustment but also an indicator of psychosocial adaptation. The loss or change of the body may redefine women's roles and self-perception, while cultural concepts such as patience, resilience, and fate may shape this process. Roy's Adaptation Model emphasizes the individual's capacity to adapt to environmental changes; accordingly, nurses may play an important role in strengthening patients' self-perception and supporting body acceptance [25].

Shen et al. also demonstrated that hope, self-efficacy, and social support increase quality of life and adaptation after breast cancer [26]. Furthermore, recent evidence indicates that body image concerns and difficulties related to changes in physical appearance are associated with poorer psychological adjustment among breast cancer survivors, emphasizing the importance of assessing body acceptance during survivorship care [27]. Therefore, hope-based and culturally sensitive approaches are important in nursing care. In this context, the Turkish version of the BAS-BC may help nurses and other healthcare professionals identify women who need psychosocial support during the adaptation process after breast cancer surgery. Overall, the Turkish version of the BAS-BC demonstrated acceptable preliminary psychometric properties for assessing body acceptance among women who had undergone breast cancer surgery. The five-factor structure suggests that body acceptance in Turkish women may involve closely related processes of bodily awareness, acceptance, and adjustment. However, considering the mixed CFA model fit and the absence of test–retest reliability analysis, the findings should be interpreted cautiously. Future studies should confirm the factor structure in larger and independent samples and evaluate the temporal stability of the scale.

Clinical implications

The validated Turkish version of the BAS-BC may provide healthcare professionals with a structured tool for assessing body acceptance among Turkish women with breast cancer. Its use in clinical practice may help identify women experiencing difficulties in body acceptance and facilitate the recognition of individuals who may benefit from additional psychosocial support. The scale may also support nurses and other healthcare professionals in planning individualized counseling and supportive care aimed at addressing body-related concerns throughout the breast cancer care process. In addition, repeated assessment with the BAS-BC may be useful for monitoring changes in body acceptance and evaluating responses to supportive interventions.

Strengths of the study

This study fills an important gap in the literature by adapting the Body Acceptance Scale for Women with Breast Cancer into Turkish culture for the first time. The validity and reliability analyses of the scale were conducted in accordance with internationally accepted psychometric principles. The use of both exploratory and confirmatory factor analyses provided a comprehensive evaluation of the scale's factor structure. In addition, the inclusion of women who had undergone surgical treatment for breast cancer supports the relevance of the Turkish version for the target population.

Limitations

This study has some limitations. First, the study was conducted in a single center with a limited sample size, which may restrict the generalizability of the findings. Second, exploratory and confirmatory factor analyses were conducted using the same dataset because of the limited sample size. Therefore, the confirmatory factor analysis findings should be considered preliminary and require confirmation in larger and independent samples. Third, test–retest reliability was not evaluated; therefore, the temporal stability of the Turkish version of the scale could not be determined. Future studies should retest the Turkish version of the scale in larger samples, different

regions, women at different stages of breast cancer treatment, and longitudinal designs. Such studies may further strengthen the evidence regarding the cultural validity, temporal stability, and clinical applicability of the measurement tool.

Conclusion

This study provides preliminary evidence regarding the validity and reliability of the Turkish version of the BAS-BC for assessing body acceptance among women with breast cancer. The Turkish version retained all 17 items of the original scale but demonstrated a modified five-factor structure compared with the original six-factor structure. Overall, the findings indicate acceptable preliminary psychometric properties; however, the mixed CFA fit indices and estimation instability suggest that the identified factor structure should be interpreted cautiously. The Turkish BAS-BC may provide a useful measure for assessing body acceptance in research and clinical practice and may assist healthcare professionals in identifying body-related concerns and planning appropriate supportive care. Further validation in larger and independent samples, as well as in different clinical settings and populations, is recommended to confirm the stability of the identified factor structure and further evaluate the psychometric performance of the scale.

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Authors' contributions Authors' contributions YY and EÜ conceptualized the study. YY conducted the methodology and data collection processes. YY and EÜ performed the formal analyses. EÜ prepared the original draft of the manuscript. YY and EÜ reviewed and edited the manuscript. All authors read and approved the final manuscript.

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Data availability The datasets used and/or analysed during the current study are available from the corresponding author on reasonable request. The data are not publicly available due to privacy and ethical restrictions.

Declarations

Ethics approval and consent to participate The study was approved by the İnönü University Scientific Research and Publication Ethics Committee (Decision No: 2024/5738; Date: 16.04.2024). Institutional permission was obtained before data collection. All participants were informed about the purpose and procedures of the study, and informed consent was obtained prior to participation. The study was conducted in accordance with the Declaration of Helsinki.

Consent for publication Not applicable.

Competing interests The authors declare no competing interests.

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