

Turkish Validity and Reliability of Body Image after Breast Cancer Questionnaire

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ABSTRACT

Background: The surgical treatment of breast cancer has a negative impact on body image. Identification of body image concerns is key to enable appropriate management. Therefore, there is a need for a valid and reliable instrument for evaluating the body image of patients. This study aimed to adapt the Body Image after Breast Cancer Questionnaire for Turkish women with breast cancer.

Methods: It was carried out at a hospital in Istanbul with 500 breast cancer patients. Language, content, construct validity, and test-retest reliability of scale were examined. Factor analysis, Cronbach α , and correlation analysis were used to evaluate the data.

Results: In this study, expert opinion was obtained after the translation was made. There was a consistency between the opinions of the experts regarding the items in the scale. The content validity index of the scale was calculated as 0.93. In the confirmatory factor analysis, the factor loads of the items were explained that 50.58% of the total variance. The overall Cronbach α reliability coefficient of the scale was .672, and the sub-dimension Cronbach α coefficients were between .618 and .841. The correlation coefficient of the scale between test and retest was .912 ($P < .001$). Confirmatory Factor Analysis results showed that the factor structure of the adapted scale was compatible with the six-factor model of the original scale. It was confirmed that the scale consists of 6 sub-dimensions: "vulnerability, body stigma, limitations, body concerns, transparency and arm concerns."

Conclusions: The findings of the study showed that the Turkish version of the Body Image Breast Cancer Questionnaire's validity and reliability were acceptable.

Keywords: *Validity, reliability, breast cancer, body image, scale adaptation*

Introduction

Although breast cancer has a high incidence all over the world and in our country,¹⁻⁵ it is a type of cancer with a good prognosis if diagnosed early.⁴ Breast cancer occurrence age is decreasing day by day.⁵ In recent years, especially in developed countries, the death rates have been decreasing with the diagnosis, treatment, and monitoring programs carried out, and more and more women are living with breast cancer.^{3,6-8} Treatment methods cause serious changes in the appearance of women.^{9,10}

Breast asymmetry and changes in skin tissue and sensitivity are common, especially after surgery. Side effects of treatment include nausea, vomiting, fatigue, hair loss, weight gain, pallor, and menopause. In addition, vaginal lubrication, arousal and decreased sexual desire cause an increase in complaints that affect body image and sexual life of women.^{11,12} In recent years, there has been an increase in the number of studies on women with breast cancer regarding complications arising from cancer treatment, which aims to increase the quality of life in women.¹³⁻¹⁵ Body image studies, which describe the perceptions of these patients regarding the physical appearance of their own bodies, have taken their place in the scientific literature.^{3,14}

Breasts are important in terms of female beauty and sexuality, which form the image of the female body, which includes self-perception and observing the reaction of others. Therefore, body image is closely related to an individual's satisfaction or dissatisfaction with his body.¹³ In addition to changes related to the presence of the tumor, such as body appearance, skin and weight changes, and breast asymmetry and size, changes related to cancer treatment may occur in patients with breast cancer.^{9,13,16} Studies have shown that mastectomy changes the body image and negatively affects body image.¹⁷ The loss of

The research was presented at the 4th International Breast Cancer Virtual Conference, between 17-18 October, 2020, Istanbul.

Cite this article as: Ceylan E, Rızalar S. Turkish validity and reliability of body image after breast cancer questionnaire. *J Educ Res Nurs.* 2022;19(2):182-190.

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Received: April 7, 2020
Accepted: October 30, 2020



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the breast is perceived as the loss of the image of femininity, the end of sexuality, and the absence of motherhood, and after the loss, anxiety increases, and adaptation to the disease and treatment becomes difficult.¹⁸ In addition to physical problems such as limited shoulder movements and posture disorders, psychosocial problems such as loss of fertility, deterioration in communication, fear of abandonment, job loss, death, and cancer recurrence are frequently experienced in women.¹⁷ Providing professional psychosocial support to women after treatment is one of the important responsibilities of the nurse. It is important to prevent psychosocial problems and to plan appropriate interventions early and carry out comprehensive studies. Evaluation of body image provides a better understanding of the effects of stress experienced due to cancer and treatment on self-esteem and social life, and enables the restructuring of body image in women.^{3,11,15}

Most studies with breast cancer patients emphasize the effectiveness of therapeutic approaches and surgical techniques and analysis of survival after oncological treatment.¹⁹ Therefore, determining the prevalence of body image dissatisfaction and associated factors in women with breast cancer undergoing treatment will pave the way for care interventions that can reduce treatment-related adverse effects in women with breast cancer. Evaluating body image with a valid tool in the treatment and rehabilitation process of women with breast cancer is the basis for defining the problems. As a result of the literature review, it was determined that the body image assessment tools were insufficient in Turkey. This study was planned in order to adapt the Body Image Breast Cancer Questionnaire (BIBCQ), which was developed by Nancy Baxter in Canada, into Turkish and to examine its validity and reliability in this language. By evaluating the body image of Turkish women with breast cancer with the scale, it will be possible to contribute to nursing care and research.

Materials and Methods

Purpose and Type of the Research

The research was carried out methodologic and descriptive in order to determine the Turkish validity and reliability of BIBCQ, which was developed for women with breast cancer, by adapting it to the Turkish language. This article includes the methodological part of the research.

Place and Time of the Research

In this study, data collection forms were applied to patients followed in the General Surgery Outpatient Clinic of a Training and Research Hospital in Istanbul between December 6, 2017 and December 6, 2018. General surgery polyclinics provide service between 8 A.M. and 4 P.M. by appointment method, and post-discharge check-ups of women with breast cancer are carried out. In addition to physicians, a nurse works in the polyclinic team and participates in the follow-up of patients with breast cancer. An average of 5-10 patients apply to the polyclinic daily, and this number reaches up to approximately 1500 annually. Each patient is checked out of the outpatient clinic at least 4 times a year.

Population and Sample

The research population consisted of women who were followed up after breast cancer treatment in the General Surgery Outpatient Clinic of a Training and Research Hospital in Istanbul. There are different opinions about determining the sample size in scale adaptation

studies.²⁰ Generally, the sample size is required to be between 5 and 10 times the number of variables included in the scale in order to perform factor analysis in scale adaptations. It is emphasized that 300, ideally more than 500, samples should be taken to reveal the factor structure of a test.^{23,24} Considering the number of items in the BIBCQ, it was predicted that a sample of 500 people would be sufficient. Since data may be lost, a total of 520 patients were included in the sampling, 500 participants were included in the analysis during the evaluation phase.

Sample selection criteria: Diagnosed with breast cancer, able to communicate in Turkish, having no hearing and speaking problems, person, place and time orientation, volunteering to participate in the study, 18 years and older, stable general condition, breast-conserving surgery, or mastectomy. After the diagnosis of breast cancer, patients who received one or more of the chemotherapy, radiotherapy or hormone therapy treatments and under medical monitoring, at least 3 months after chemotherapy treatment, and at most 5 years after treatment individuals who did not have a psychiatric illness during this period were included in the study.

Exclusion Criteria: Patients who were illiterate, had mental retardation, and were treated with chemotherapy during the study were excluded from the sample because their body image would be affected. Verbal and written consent was obtained from the patients participating in the study.

Data Collection Tools

Data were collected with the Descriptive Characteristics Form and the Turkish form of the BIBCQ. The Introductory Characteristics Form includes the patient's age, marital status, number of children, education level, income level, occupation, chronic disease, time passed after surgery, treatments for breast cancer, family history, cancer stage, type of surgery, and reconstruction status. Body Image After Breast Cancer Questionnaire (BIBCQ) scale, the original form of BIBCQ, was developed by Nancy Baxter (1998) and is based on the multidimensional body image concept of individuals with chronic diseases developed by Vamos.^{25,26} The original form consists of 2 parts and 53 items, 6 consists of subscales. The scale was organized in 2 parts, including items on emotional states and environmental factors. The items in the 1st part of the scale are scored in a 5-point Likert scale (Strongly disagree: 1, Disagree: 2, Undecided: 3, Agree: 4, Strongly agree: 5), and the items in the 2nd part (Never: 1, Rarely: 2, Sometimes: 3, Usually: 4, Always: 5). In addition, 45 of the 53 items in the original scale are common items and 8 items (24, 25, 26, 27, 28, 51, 52, 53) are optional items. In its original form, as the total score of the scale increases, the negative body perception of the individual increases. The sub-dimensions of the scale are "Vulnerability," "Body stigma," "Limitations," "Body concerns," "Transparency," and "Arm concerns." The vulnerability sub-dimension in the scale expresses the woman's feelings about her body's sensitivity to cancer. Items in the body stigma sub-dimension include the thoughts and behaviors of the woman regarding her need to hide her body. The limitations sub-dimension describes women's feelings about their competence and abilities. Body concerns sub-dimension express the individual's satisfaction with his body shape and appearance. Items belonging to the transparency sub-dimension describe the salience of changes in appearance due to cancer. Arm concern sub-dimension refers to concerns about the appearance of the arm and symptoms in the arm. The α reliability coefficient of the original scale was reported as 0.88.^{25,26} Scale sub-dimension and total scale scores are obtained by adding the scores given to the items.

In the validity study of BIBCQ, language, content, and construct validity were examined.

Language and Content Validity of the Scale

Before starting the research, permission was obtained from the author of the original scale, and then language and cultural adaptation was made by following the translation, expert opinion, back translation, and pilot application steps suggested in the literature.

In the first step, the translation phase, the scale was translated from English to Turkish by experts in the field, whose native language is Turkish and who know both languages at the native level. By comparing the translations with each other, all the items of the scale were examined by the researchers and a common text was created by reaching a consensus among them. The linguistic equivalence study of the tool was conducted in accordance with WHO criteria.²⁴ After the translation phase, the expert opinion phase was started. After the Turkish translation of the tool was made, it was submitted to the opinions of experts from the field of nursing science to ensure the content validity, and the experts were asked to evaluate each item. The content validity rate was determined by taking the opinions of 14 academicians from the field of nursing. Davis Technique was used for content validity index (CVI) analysis. In this technique, "absolutely appropriate (4), "appropriate (3)," "not appropriate (2)," and "absolutely not appropriate (1)" are graded. CVI is calculated by dividing the number of experts who gave 3 or 4 points in the expert responses for each item, by the number of all experts. Appropriate evaluation was made for each item by the experts. The content validity ratios of the items in this index are expected to be over 0.80.²⁴ In line with expert opinions, the content validity values of items 20 and 23 in the original scale were found to be lower than the desired value; 20th item's CVI=0.64, 23rd item's CVI=0.71. As a result of expert opinion, 20th item "I am satisfied with the appearance of my hips" and 23rd item "I am satisfied with the shape of my hips" were removed from the scale. The content validity index, total value of the scale was found to be 0.93. Also 2,10,11,22. items in line with expert recommendations; Item 2 was corrected as "I don't have any numbness or loss of sensation in my arm," item 10 as "I like my body," item 11 as "I feel comfortable about my appearance while exercising," item 22 as "I feel that something is taking control of my body."

In the third stage, back translation was applied. The scale, which was prepared with expert opinions, was translated back into English by 3 translators whose native language was Turkish and who knew both languages at the native level, who did not participate in the first stage of translation. The translation was compared with the English original and examined in terms of whether there were any items that did not fully comply with the original. Then, the scale was reviewed together with the researchers by a linguist who knows Turkish well. In this way, the Turkish version of the scale was arranged.

Finally, a pilot application was conducted for content validity. After the scale was prepared, it was applied to 10 people with similar characteristics from different education levels, and opinions were obtained in terms of intelligibility. The vehicle was given its final shape and started to be implemented. As each item was found to be understandable as a result of the pilot application, no changes were made in the text.

Construct Validity

Confirmatory factor analysis (CFA) was applied to determine the construct validity of BIBCQ. First of all, KMO and Bartlett tests were conducted to understand whether the scale was suitable for factor analysis. According to the tests, the KMO test measurement result should be 0.50 and above, and the Bartlett sphericity test result should be statistically significant. CFA was performed to confirm the structure described in the BIBCQ and to reveal the structure of the scale.

Reliability of the Scale

Internal consistency and test-retest were used to evaluate the reliability of the scale. To determine the internal consistency of the scale, item-total correlations and Cronbach's α coefficient were calculated. In the reliability study of the scale, the test-retest technique was used to determine the criterion of invariance over time, and the scale was re-administered to 30 patients 3 weeks after the first measurements. The test-retest technique was evaluated by Pearson product-moment correlation.

Data Collection

Research data collection forms were applied to 500 patients followed in the General Surgery Outpatient Clinic of a Training and Research Hospital in Istanbul. Outpatient clinic control appointment dates and times of the patients were learned by communicating with the outpatient clinic nurse in advance. After obtaining written informed consent from the participating patients by the researcher, the data collection form was filled. The demographic data and medical history of the patient were asked, and the data on the disease process and treatments were obtained from the medical records. Filling the data collection form took an average of 15-20 minutes. The retest was performed 3 weeks after the application by including 30 different participants.

Data Analysis

Evaluation of the data was done with SPSS v.22 (IBM SPSS Corp.; Armonk, NY, USA) and AMOS Graphics 24 package programs. Since the optional items in the original form of the scale did not address the entire sample, these items contributed little to the Kaiser-Meyer-Olkin or Bartlett values and were not included in the analysis, and 43 common items were included in the analysis. In the study, data on the characteristics of patients with breast cancer were shown as numbers and percentages. Confirmatory factor analysis was performed for construct validity. In the reliability analysis of BIBCQ, the Pearson product-moment correlation technique and test-retest correlation were used to evaluate the measurement stability. The internal consistency of the scale was measured by Cronbach's α reliability coefficient and item-sub-dimension and item-total score analysis. The analyses were evaluated at the 95% confidence interval, at the 0.05 significance level.

Ethical Aspect of The Research

Written permission was obtained from N.B., who developed the BIBCQ scale, to adapt the scale into Turkish. In order to carry out the study; Non-Interventional Research Ethics Committee approval (05.10.2016/467) and institutional permission were obtained from the Medical Ethics Committee of Istanbul Medipol university in Istanbul. Written informed consent was obtained from the patients participating in the study.

Results

In this study, 44.2% of the women are between the ages of 51-70, 69% are married, 41.6% are high school graduates, 79.6% are middle-income, 80.2% of them have children, 24.4% are working, 43.8% are retired. 44.6% of patients have a family history of cancer. Time elapsed after surgery: 0-1 year in 20.6%, 2-3 years in 56%, 4 years or more in 23.4%. It was determined that 40.8% of the patients received surgery and radiotherapy, while 28% received surgery, chemotherapy, and radiotherapy. Around 25.4% of the patients are in the 1st stage of cancer, 67.6% in cancer stages 2 and 3. Twenty percent of the patients had lumpectomy; 11.8% had total mastectomy; 30% had modified mastectomy; 38.2% had radical mastectomy; and 30% of the participants had breast reconstruction.

In the validity study of MKBÖ, language validity, content validity, and construct validity were examined.

Language and Content Validity Results

The tool was translated from English to Turkish independently by experts in 3 fields. By comparing the translations, the most appropriate expressions were selected and a Turkish scale was obtained. Then, each item was examined by a Turkish language expert in terms of its grammatical compatibility. The Turkish-translated instrument was translated back from Turkish to English by another linguist who knows foreign language and culture well. The translation was compared with the English original and the Turkish versions of the articles that did not fit the original were reviewed and evaluated. After comparing the created English scale with the original scale, it was determined that there was no difference in meaning.

After the tool was adapted to Turkish, it was presented to the opinions of experts from the field of nursing science to ensure content validity. Davis Technique was used for content validity analysis. The content validity rate was determined by taking the opinions of 14 experts from the field of nursing. In this technique, "absolutely appropriate," "appropriate," "not appropriate," and "absolutely not appropriate" are graded. In our study, the CVI values of items 20 and 23 in the original scale were found to be low. Twentieth item KGI=0.64, 23rd item KGI=0.71. As a result of expert opinion, items 20 and 23 were removed from the scale. Total KGI 0.93 found. The Turkish version of BIBCQ was given its final form and applied to 10 people with similar characteristics to the patients to be included in the study, for the purpose of a pilot study. Since each item was found to be understandable in the pilot application, no changes were made.

Construct Validity Findings

Kaiser-Meyer-Olkin (KMO) and Barlett tests were used to determine sample adequacy in the study. According to the literature, if the Kaiser-Meyer-Olkin value is between 0.90 and 1.00, it is perfect; between 0.80 and 0.90, it is good; between 0.70 and 0.80 it is medium level; it is evaluated as weak if it is between 0.60 and 0.70; and bad if it is below 0.60. The KMO value (0.878) obtained in this study showed that the sample size was good. Whether the data come from a multivariate normal distribution is determined by the significance of the χ^2 value obtained as a result of the Barlett test. The Barlett test χ^2 value obtained from the study was found to be 11945.524 ($P < .000$), the P value showed that the sample was sufficient for factor analysis.

Confirmatory factor analysis (CFA) was conducted in order to confirm the structure described in the original form of BIBCQ and to reveal the

structure of the scale. Principal components analysis findings show the distribution of the items within the factors. Principal component analysis findings are given in Table 1. Of the 53 items in the original scale, 8 items (24, 25, 26, 27, 28, 51, 52, 53) specified as optional items by Baxter were not included in the factor analysis. Since 2 items were removed after expert opinion, factor analysis was performed with 43 items (Table 1). The factor loads of the items vary between 0.276 and 0.951 and explain 50.58% of the total variance. The path diagram created in the research is shown in Figure 1. According to the results of the analysis made with a total of 43 items, the DFA fit values were found as follows: RMSEA = 0.079, CMIN/DF = 4.143, IFI = 0.769, GFI = 0.735 and CFI = 0.767.

Reliability Findings

Internal consistency analysis, Cronbach's alpha method was used for the reliability of the scale. The internal consistency coefficients measured for each dimension are given in Table 2. It is seen that the internal consistency coefficient of each sub-dimension of the scale is above the level of 0.618. Cronbach's alpha values in sub-dimensions are: vulnerability: 0.706, body stigma: 0.618, limitations: 0.700, body concerns: 0.839, transparency: 0.841, arm concerns: 0.719, and BIBCQ total: 0.672. Since the internal consistency coefficients of each sub-dimension of the scale were above the limit, the internal consistency of item deletion was not checked, and it was determined that the internal consistency values of all the items included in the analysis were also valid in the Turkish version.

To test the invariance of the scale against time, the test-retest score correlation was examined in the study. The results of both measurements of the scale, which was given to 30 participants with an interval of 3 weeks, are given in Table 3. The correlation coefficient between the test-retest of BIBCQ was 0.912 ($P < .001$). From the sub-dimensions of the scale, vulnerability sub-dimension: $r=0.884$ ($P < .001$); body stigma sub-dimension: $r=0.915$ ($P < .001$); limitations sub-dimension: $r=0.903$ ($P < .001$); body concern sub-dimension: $r=0.931$ ($P < .001$); transparency sub-dimension: $r=0.712$ ($P < .001$); and arm concern: $r=0.955$ ($P < .001$). It was determined that there was a highly significant positive correlation between the first application and the second application point averages of the scale ($P < .001$).

Discussion

Today, cancer has become one of the most important problems facing humanity, both personally and universally, with the physical, mental, and social trauma it creates in the person. Breast cancer is among the most common cancer types that cause death in our country and in the world. It has been reported that young women with breast cancer have lower self-esteem, worry more about their body image and experience difficulties. The absence of breasts, which is the symbol of femininity, causes psychosocial traumas. Nurses, who take an active role in the sustainability of health process, take an active role in helping women with breast cancer get through this process. Nurses who approach the patient holistically in breast cancer have limited research on body image. In this study, BIBCQ developed by Baxter et al²⁶ was adapted into Turkish in order to determine the body image levels of women with breast cancer. In the scale adaptation study, standards were followed; translation, content validity, and construct validity were examined; internal consistency analysis and test-retest were performed.

Table 1. Factor Loads of the Body Image Breast Cancer Questionnaire (N=500)		
Sub-dimensions	Items	Factor Loads
Vulnerability	4. I feel there is a time bomb inside of me.	.568
	7. I feel prone to cancer.	.547
	13. I feel my body has been invaded.	.617
	15. I feel my body has let me down.	.481
	22. I feel that people are looking at my chest.	.474
	33. I worry that the cancer is spreading.	.276
	35. I think about breast cancer.	.580
	39. I worry about my body.	.375
	41. I feel angry at my body.	.663
Body stigma	42. I need reassurance about my health.	.464
	48. I worry about minor aches and pains.	.735
	1. I try to hide my body.	.464
	3. I avoid looking at my scars from breast surgery.	.363
	9. I feel less feminine since cancer.	.263
	12. I would feel comfortable changing in a public change-room.	.749
	18. I feel that part of me must remain hidden.	.641
	19. I am afraid of touching the scars from breast surgery.	.534
	21. I avoid close physical contact such as hugging.	.520
	30. I avoid physical intimacy.	.354
	32. I hide my body when changing clothes.	.492
	37. I feel sexually attractive when I am nude.	.372
	40. I would keep my chest covered during sexual intimacy.	.548
Limitations	5. I am sleepy during the day.	.469
	6. I am happy with my level of energy.	.489
	17. Others have had to take over my duties.	.469
	36. Being tired interferes with my life.	.669
	43. I can participate in normal activities.	.590
	44. I have problems concentrating.	.575
	45. My body stops me from doing things I want to do.	.413
	49. I feel normal.	.445
Body concerns	8. I am satisfied with the shape of my body.	.942
	10. I like my body.	.951
	11. I feel comfortable about the way I look when I exercise.	.926
	16. I like my looks just the way they are.	.927
Transparency	29. I feel that people are looking at my chest.	.746
	31. I feel that people are looking at me.	.812
	34. I need to be reassured about the appearance of my bus.	.801
	46. I think my breasts appear uneven to others.	.716
Arm concerns	50. I feel people can tell my breasts are not normal.	.733
	2. The feeling in my arm is normal.	.732
	14. I am satisfied with the appearance of my arm.	.416
	38. Swelling of my arm is a problem for me.	.480
	47. Arm pain is a problem for me.	.800
Total variance explained	%50.58	

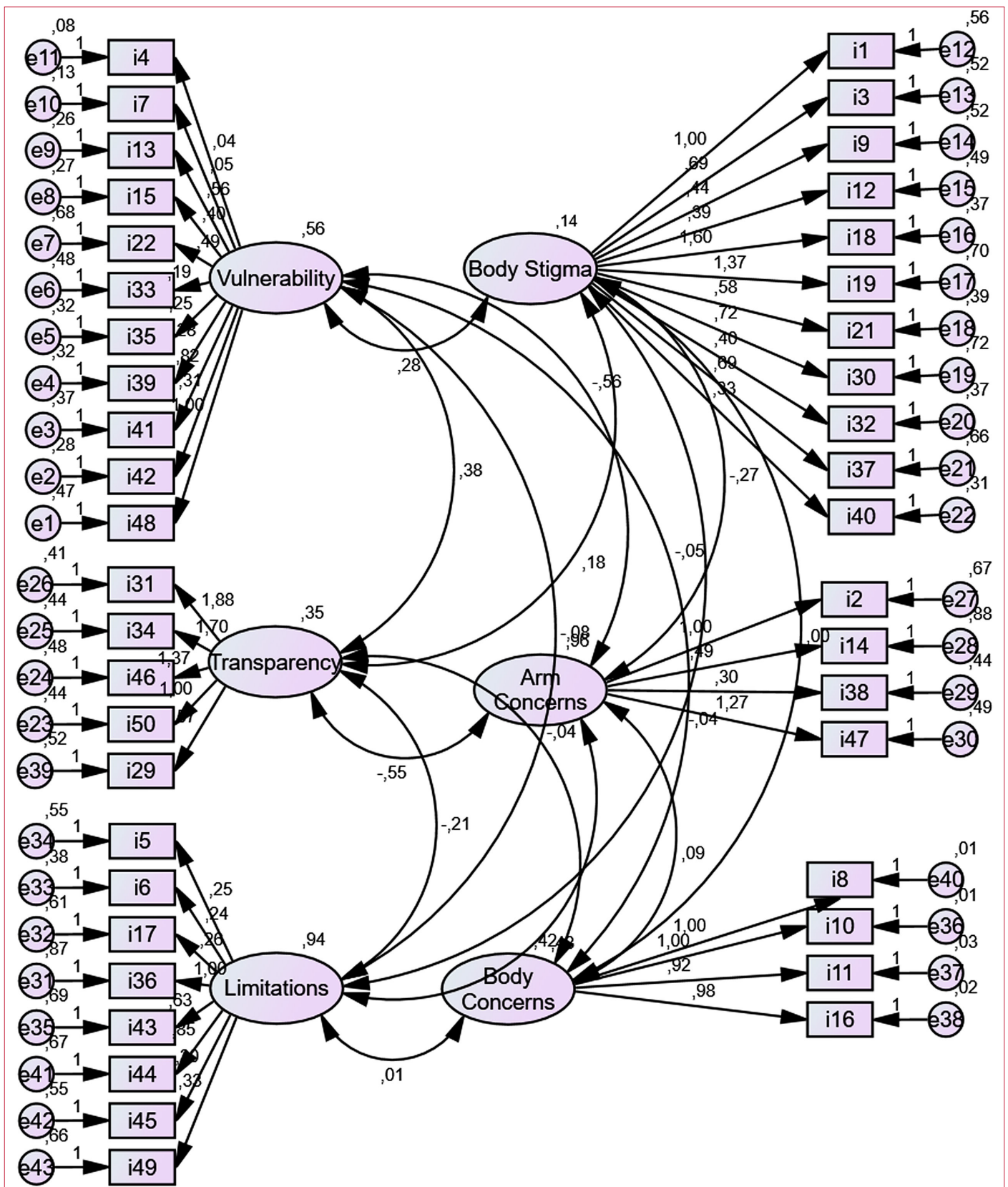


Figure 1. Standardized coefficients of the BIBCQ's six-factor model, path diagram, and factor loads.

Scale and Subscales	Item Number	Cronbach's Alpha
Vulnerability	11	0.706
Body stigma	11	0.618
Limitations	8	0.700
Body concerns	4	0.839
Transparency	5	0.841
Arm concerns	4	0.719
Total BIBCQ	43	0,672

Scale and Subscales	BIBCQ Mean Scores		r/P
	Test X ± SD	Retest X ± SD	
Vulnerability	33.3 ± 3.7	33.8 ± 3.6	0.884/.000
Body stigma	38.13 ± 2.68	39.16 ± 2.62	0.915/.000
Limitations	23.3 ± 2.5	24.16 ± 2.5	0.903/.000
Body concerns	15.6 ± 2.7	15.7 ± 2.4	0.931/.000
Transparency	12.8 ± 2.17	13.9 ± 1.57	0.712/.000
Arm concerns	16.26 ± 1.5	16.3 ± 1.6	0.955/.000
Total BIBCQ	142.7 ± 8.3	147.4 ± 8.2	0.912/.000

SD, standard deviation.

Language and Content Validity

Linguistic equivalence was first ensured in the language and content validity phase of BIBCQ. The tool was translated from English to Turkish. By comparing the translations, the most appropriate expressions were selected and a Turkish scale was obtained. The resulting scale was translated back into English and it was determined that it was not semantically different from the original tool. Davis technique method was used for the content validity of the scale. The total KGI value in the scale was found to be 0.93 at a sufficient level. The CVI value of the 20th and 23rd items in the original scale was found below the limit value of 0.8028, these items were removed from the scale. It was observed that the content validity of the remaining 43 items was provided. Of the 43 items in the Turkish scale, 32 contain positive and 11 contain negative statements.

Construct Validity

The factor structure and distinguishing feature of the scale were examined during the evaluation of the construct validity of the scale. Before the factor analysis, the KMO test, which determines the sample size, and the Barlett test, which determines whether the scale is suitable for factor analysis, were applied.²⁹ In the study, the KMO value was 0.878 and the Barlett test χ^2 value was 11945.524 ($P < .05$). The lower limit for KMO is 0.50, and a KMO value between 0.8 and 0.9 indicates that the sample size is sufficient.^{30,31} Bartlett's test value lower than $p < .05$ means that it is suitable for factor analysis.

It is considered appropriate to prefer CFA to verify the previously developed models, which were created on a theoretical basis and the number of factors and the relationship between these factors are clear.³² With CFA, it can be evaluated whether the factor structure of the original form of the scale can be verified in the Turkish sample, and whether the items are adequately represented in the sub-dimensions. and whether it is sufficient to explain the structure of the scale can be tested.⁴⁰

There are many fit values in the literature that evaluate a measurement tool with CFA. The most frequently used among these fit values are "RMSEA" and "CMIN/DF" values. In our study, the RMSEA (Root Mean Square Error of Approximation) value was found to be 0.079. Our finding was interpreted as an acceptable value since the RMSEA value was less than or equal to .08, which was accepted as a criterion.^{33,34} This indicates that the model is moderately valid. The second fit value in our findings was determined as CMIN/DF ratio of 4.143. Again, in our findings, it was emphasized that CMIN/DF value up to 5 is acceptable. 35.36 CMIN/DF and RMSEA values of the BIBCQ Scale show that the scale has data compatibility with the model and is an acceptable model. This indicates that the factor structure of the Turkish form of the scale is compatible with the original factor structure. From other compliance values; the Goodness of Fit Index/GFI was 0.735, the Incremental Fit Index/IFI value was 0.769, and the Comparative Fit Index/CFI value was 0.767.

If the fit values are close to 1, it shows that there is an acceptable fit, and as it gets closer to 1, the fit of the model increases. The value ranges required by well-fit models differ according to the number of expressions in the model and the size of the sample. Although the values generally accepted by the researchers are certain, there is no single truth in the fit test phase of the model and it is necessary to look at many values at once.^{36,37} When the goodness of fit values obtained as a result of CFA in our study are examined; According to RMSEA and CMIN/DF value, the model was determined to be an acceptable model.³⁵ Other GFI and CFI values that tested goodness of fit were found to be below the 0.90 limit recommended for good fit. Our findings indicate that the fit indicators of the model are acceptable in the CFA, in which the suitability of the items that fall under the factors in the original MSBIQ to the Turkish sample is tested. The RMSEA value was determined as .071 in the cross-cultural Brazilian version.³⁸ It was reported that the RMSEA value in the Polish version was accepted as .088 with a satisfactory fit level.³⁹ Our findings were similar to the confirmatory factor analysis findings of the adaptation study conducted in other countries.

A value taken into account in confirmatory factor analysis is the factor loadings, which show the relationship between each factor and the item under this factor. In our study, it was observed that the factor loads of the items ranged between 0.276 and 0.951, explaining 50.58% of the total variance. In our study, factor loading of all items except for 2 items (Item 9: 0.263 and Item 33: 0.276) was above the 0.3 limit. Items with a factor load below 0.3 should be removed from the scale at this stage. Based on the knowledge that the normal value of the factor load may decrease according to the number of samples, these items were not removed from the scale. Various ranges have been proposed for factor loadings. For example, while the lower limit is 0.3 for a sample of 350 people, the lower limit is lower for more samples.^{36,37} Accordingly, since the sample size was 500 people in our study, it can be interpreted that both values are at an acceptable

level. According to the factor analysis findings, it is seen that the items in the scale represent their own sub-dimension.

Reliability

In the reliability study of the scale, the internal consistency and time invariance of the scale were determined. The internal consistency of the measurement tool is the reliability that determines that all units of the scale are capable of measuring the variable being measured. The alpha coefficient is a measure of the internal consistency of the items in the scale. It is commented that the higher the alpha coefficient, the more consistent the items in the scale are with each other and consist of items that examine the elements of the same feature, or that all the items work together to the same extent.⁴¹ In the literature, it is reported that the alpha coefficient between 0.60 and 0.80 proves the reliability of the scale.²¹ The Cronbach's Alpha value of the scale we adapted was 0.672, which indicates that the items in the scale are consistent with each other, that is, the scale has reliability.

When the BIBCQ Cronbach α coefficients are examined; a total of 0.672, vulnerability 0.706, body stigma 0.618, limitations 0.700, body concerns 0.839, transparency 0.841, arm concerns 0.719. The Cronbach's α coefficient was found to be 0.88 in the original version of the BIBCQ.²⁶ The total scale Cronbach's α coefficient was 0.70 in the Brazilian version, and it ranged from 0.67 to 0.83 in the sub-dimensions.³⁸ The internal consistency coefficients of the Turkish version of the scale were found to be similar to the findings of the original scale and the Brazilian version. While it was determined that the lowest stigma was among the sub-dimensions of the scale in the Brazilian version, the lowest subscale was determined as stigma in the Turkish version. While the subscale with the highest Cronbach's alpha value is body anxiety in the Brazilian form, it is the transparency subscale in the Turkish version.

Test-retest analysis is recommended to demonstrate the time invariance of a scale. It was stated that the second repeated application should be done with at least 30 people and the average time between the 2 tests should be between 15 and 45 days. In this case, it is stated that the reliability of the test increases.⁴³ In this study, the scale was re-administered to 30 patients 3 weeks after the first application. After the application, it was determined that the correlation value of the test-retest analysis of BIBCQ was $r = .912$ ($p < .001$), and there was a highly significant correlation between the measurements. In Baxter's (1998) study, the test-retest correlation coefficient was found to be 0.87.²⁵ Thus, our findings in terms of time invariance of the scale are in line with Baxter's findings. In addition, correlation analysis findings between test-retest scores for sub-dimensions showed that there was a moderate and high level of correlation (Table 3).

The construct validity and related CFA analysis findings of the BIBCQ scale adapted into Turkish showed that the data were compatible with the original scale, confirming the six-factor structure, and explaining the factor structure in which the relevant item was found. The lowest and highest scores that can be obtained from the sub-dimensions and the total scale in the Turkish version of the scale are as follows: vulnerability: 11-55 points, body stigma: 11-55 points, limitations: 8-40 points, body concerns: 4-20 points, transparency: 5-25 points, arm concerns: 4-20 points, total BIBCQ: 43-215 points. In our study, the form consisting of 43 items and 6 sub-dimensions of the scale, of

which 2 items were removed after expert opinion, was confirmed by the analysis. As a result, it was determined that the Turkish version of BIBCQ is a valid and reliable tool for Turkish society.

Limitations

The research is the first psychometric study of the BIBCQ in Turkish patients. The main limitation of the study is that the data were obtained from a single center. However, the province where the research was conducted is the most populous province of the country and receives immigration from the whole country. A large number of patients from different parts of the country are admitted to the research institution, as well as those living within the borders of the province. Another limitation is that similar scale comparisons should not have been made in the study.

Conclusion and Recommendations

As a result, it was revealed that BIBCQ is a valid and reliable scale that can be used in practice and research to measure body image in Turkish-speaking women who have undergone breast surgery. The scale includes information about the feelings and thoughts of women who have undergone surgery for breast cancer. Determining the woman's body image level by measuring will shed light on intervention studies that can improve post-operative body image. Based on the findings, the use of BIBCQ can be suggested in the care of Turkish breast cancer patients, to introduce it to nurses in on-the-job training and to use it in practice, and to use it in nursing research.

Ethics Committee Approval: Ethics committee approval was received for this study from Istanbul Medipol University Ethics Committee (date and number: 05.10.2016/467).

Informed Consent: Informed consent was obtained from the volunteers participating in the study.

Peer-review: Externally peer-reviewed.

Author Contributions: Concept – S.R., E.C.; Design – S.R., E.C.; Supervision – S.R., E.C.; Resources – S.R., E.C.; Materials – S.R., E.C.; Data Collection and/or Processing – S.R., E.C.; Analysis and/or Interpretation – S.R., E.C.; Literature Search – S.R., E.C.; Writing Manuscript – S.R., E.C.; Critical Review – S.R., E.C.

Acknowledgments: The authors would like to thank the women with breast cancer who participated in the study and the academicians who provided expert opinions.

Declaration of Interests: The authors have no conflicts of interest to declare.

Funding: The authors declared that this study has received no financial support.

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