Examining the Psychometric Properties of the Farsi Version of the Body Image Scale for Breast Cancer Survivors

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Abstract
Background Mastectomy as a surgical treatment in women with breast cancer causes a change in their body image due to the loss of femininity and body integrity, decreased sense of sexual attractiveness, and dissatisfaction with the presence of surgical scars. The present study was conducted to evaluate the psychometric properties of the Farsi version of the body image scale for breast cancer survivors.

Methods This cross-sectional study was conducted on 204 women with a mastectomy referred to Kermanshah’s surgery and oncology office in 2021. Face and content validity were evaluated qualitatively. Construct validity was evaluated by exploratory factor analysis (with maximum likelihood and Promax rotation) and confirmatory factor analysis. Cronbach’s alpha and McDonald’s omega coefficients were used to verify internal consistency.

Results The mean age of the participants was 46.57 (SD = 9.47). One factor was extracted that explained 46.56% of the total variance of body image. The factor load of the items varied between 0.561 and 0.801. The results of CFA also showed that the final model has a perfect fit: CMIN = 20.931; DF = 13; CMIN/FD = 1.610; p = 0.074; GFI = 0.972; AGFI = 0.939; IFI = 0.985; CFI = 0.985; TLI = 0.975; PNFI = 0.595; PCFI = 0.610; RMSEA = 0.055. internal consistency based on Cronbach’s alpha and McDonald’s omega coefficients was 0.856 and 0.861, respectively.

Conclusion The Farsi version of the body image scale for breast cancer survivors has good construct validity and may be used in various studies in clinical and research settings.

Keywords Mastectomy · Breast cancer · Psychometric evaluation · Body image scale

Introduction
Breast cancer is one of the most common cancers in women and the second cause of cancer-related death [1]. In 2020, breast cancer patients and deaths were 2.3 million cases and 685,000 deaths, respectively. Breast cancer in women is responsible for a quarter of all cancers and 15.5% of all cancer deaths, and in 2020, it ranked first in incidence and mortality in most countries of the world [2].

Recent advances in early detection and treatment have significantly increased women’s life expectancy [3]. Treatment methods for women with cancer, such as surgery, radiotherapy, chemotherapy, and radiation therapy, can be associated with various side effects. The most common side effects of chemotherapy are nausea, alopecia, sexual dysfunction, hair loss, and ovarian damage [4–8]. Skin swelling, inflammation, and redness are also side effects of radiation therapy [8]. The primary goal of breast cancer surgery is to remove cancer and determine its stage. Surgical treatment includes mastectomy or breast-conserving surgery (BCS). In BCS, also known as partial mastectomy or lumpectomy, only cancerous tissue and a rim of normal tissue (tumor margin) are removed [9]. In addition to physical complications, breast cancer can cause extensive changes in the body and mind of patients. The
most devastating psychological impact of breast cancer on women is the impact on their body image [10, 11]. Mastectomy leads to feelings of mutilation and diminished self-worth and affects body image [12]. Body image refers to a person’s mental image of his body, attitude about physical self, health status, integrity, normal functioning, and sexuality [6]. Negative body image among breast cancer survivors includes dissatisfaction with appearance, loss of femininity and body integrity, reluctance to look at one’s self naked, decreased sense of sexual attractiveness, and dissatisfaction with surgical scars [6]. Removing the entire breast causes the loss of symmetry and apparent changes in the physical appearance, which is evident even from the clothed body and affects the person’s clothing [13]. The more invasive the breast surgery (i.e., mastectomy vs. lumpectomy), the more damaging it affects mental health [14]. Considering the importance of the breast to women’s body image, losing it through mastectomy has multiple meanings and can create conflicting feelings [6].

All women have concerns about the effect of a mastectomy on their body image and quality of life, which can last for years even after successful treatment [15, 16]. After mastectomy, women experience a wide range of physical changes that affect their bio-psychosocial functions. Often these women never discuss these concerns with their healthcare professionals. These changes experienced from one woman to another can be different, so it is essential to recognize and measure them [17]. Several scales assess body image in women with mastectomy [14, 18–20]. So, these scales were not validated in the samples of survivors diagnosed for more than two years. These scales did not describe a conceptual framework to guide development [14, 19, 20]. The Body Image Scale for Breast Cancer Survivors (BISBS) was designed by Biederman et al. (2020) for long-term breast cancer survivors (3 to 8 years) who underwent a mastectomy, lumpectomy, chemotherapy, or radiation therapy [21]. Based on the explanations provided and considering the limitations of the available tools, the present study was conducted to evaluate the psychometric properties of the Farsi version of the body image scale for breast cancer survivors.

**Methods**

**Study and Setting**

This cross-sectional and methodological study were conducted on women referring to the office of several oncology specialists and surgeons in Kermanshah in 2021.

**Participants**

Due to the limited number of these patients, sampling continued from November 2020 to July 2021. Participants were selected by convenience sampling. The inclusion criteria were: the person’s willingness to participate in the study, having undergone mastectomy surgery, their chemotherapy period has ended, more than six months have passed since their mastectomy surgery, and they are over 18 years old. Patients with a history of other cancers, mental disorders, and the use of antidepressants and anxiety medications were excluded from the study. During this interval, 204 eligible patients were included in the study and were randomly divided into two equal groups. Exploratory factor analysis (EFA) was performed on one group, and confirmatory factor analysis (CFA) on the other group. After receiving the letter of introduction and coordination with the Kermanshah University of Medical Sciences and specialists, the third author, continuously visited these clinics and offices every day and took samples. At first, the study’s objectives were explained to the referring women, and after obtaining informed written consent, the questionnaire (anonymously) was provided to them. It was explained to the patients that completing these questionnaires is optional and has no effect on their treatment and evaluation process, and all information remains confidential.

**Translation**

After obtaining permission from the leading designer, the original version of this questionnaire was translated using the forward–backward method. First, two independent translators translated the original version into Farsi, and the final version was prepared by comparing the two versions. In the next step, the Farsi version was translated into English by two other translators, and after evaluation by the research team, the final English version was prepared [22].

**Measure**

**Demographic Information Form**

Demographic information forms and The Farsi version of the Body Image Scale for Breast Cancer Survivors (F-BISBS) body image questionnaires were used on breast cancer survivors to collect data. Demographic information included age, marital status, number of children, education, occupation, residence status, income, illness duration,
mastectomy duration, and type of mastectomy. Body image scale for breast cancer survivors.

**The Farsi Version of the Body Image Scale for Breast Cancer Survivors (F-BISBS)**

This scale included seven questions with answers on a 5-point Likert scale from 1 (very much) to 5 (very little). The final score varied between 7 and 35. A higher score means a better body image [11]. Also, the inter-item correlations between the items were above 0.7, indicating the items’ redundancy. Internal consistency based on Cronbach’s alpha was 0.88, and item-total correlations ranged from 0.367 to 0.829. In the exploratory factor analysis, one factor was extracted that explained 48.35% of the total variance. Also, the factor loading of the items varied between 0.446 and 0.889 [21].

**Face and Content Validity**

Face validity refers to the extent to which an instrument measures what it is intended to measure [23]. To evaluate content validity, the F-BISBS was given to five patients with a mastectomy to read the questions aloud and answer them. They were asked to identify any ambiguous sentences and give us their feedback. The purpose of content validity is to minimize the possible error related to the operationalization of the scale in the early stages and the possibility of obtaining the validity of the supporting structure in the later stages. Content validity indicates the degree to which the items together form an adequate operational definition of the construct. It helps the researcher to get invaluable feedback from a panel of experts and evaluate the dimensions of the construct intended to be measured [24]. Also, to evaluate the content validity, five experts (a surgeon, an oncologist, a nurse, a psychologist, and a methodologist) were requested to review the questionnaire in terms of content and inform us of the crucial issues.

**Construct Validity**

To assess construct validity, in first, Parallel analysis was used to extract the factor and next maximum likelihood EFA with the Promax rotation was performed. Sampling adequacy was evaluated by the Kaiser–Meyer–Olkin (KMO) test > 0.7 [25] and the Bartlett’s test of sphericity. The presence of one item in the factor was also considered by factor loading > 0.3 [26] and communalities > 0.2 [27]. Then, the extracted factor by EFA was assessed by CFA. The fit of the model was evaluated using: chi-squared test (χ2), chi-square ratio to degree of freedom (CMIN/df), the goodness of fit index (GFI), adjusted goodness of fit index (AGFI), normed fit index (NFI), incremental fit index (IFI), confirmatory fit index (CFI), and root mean square error of approximation (RMSEA) [27].

**Reliability**

The acceptable internal consistency of the F-BISBS was evaluated with Cronbach’s alpha and McDonald’s omega coefficients > 0.7 [27]. Considering the limitations of Cronbach’s alpha coefficient, which is affected by the number of items and sample size, McDonald’s Omega coefficient was also reported to evaluate internal consistency [28]. Statistical analyzes were performed with SPSS-AMOS 26.

**Results**

**Findings Description**

Two hundred four women with a mean age of 46.57 (SD = 9.47) ranging from 28 to 76 years participated in this study. Most participants were married, had two children, had a university education, were unemployed, lived in the urban area, and had an average financial status. Also, 91.7% of women had a unilateral mastectomy, and only 18.6% of these women had breast prostheses. The average score of body image in these women was 21.01 ± 4.42. The body image score of women with an average financial status was higher than that of women with poor financial status (p = 0.030). Also, the body image score in women with breast prostheses was significantly higher than in other women (p < 0.001). More details are provided in Table 1.

**Face and Content Validity Results**

In formal validity, the samples emphasized the simplicity and fluency of the items. In terms of content validity, item number 2 was rewritten.

**Construct Validity Results**

The results of the EFA showed that the F-BISBS among the studied Iranian women has one factor. Therefore, the items of the present scale explain 46.56% of the variance of the concept of body image for breast cancer survivors. Also, the results of CFA showed that the extracted model of the body image scale in Iranian breast cancer survivors has a sufficient and appropriate fit. So that item #7 (I feel good about my body) had the highest, and item #4 (Others consider me attractive) had the lowest factor load in the EFA and CFA (Table 2 and Fig. 1). Also, internal consistency based on Cronbach’s alpha and McDonald’s
omega coefficients was 0.856 and 0.861, respectively. In other words, the acceptable internal consistency of the body image scale for breast cancer survivors among Iranian women shows that there is an interrelationship and homogeneity among the items.

### Discussion

The results of this study, which was conducted to evaluate the psychometric properties of the Farsi version of the BISBS, showed that it has acceptable validity and reliability and has covered the limitations of the previous scales. The body image index has seven items designed by Lasry et al. (1987). This scale was only tested on women with mastectomy and lumpectomy, but it was not tested on women undergoing chemotherapy [20]. The body image scale was designed by Hopwood et al. (2001) and has ten items that measure body image in all oncology patients (and not only breast cancer survival with mastectomy) [19]. The body image after breast cancer questionnaire has many items (53 items), which limits its usefulness in clinical settings and imposes a response burden on the participants [18]. Also, another scale designed by Collins et al. (2011) was tested only on patients undergoing mastectomy, chemotherapy, and short-term radiation therapy, and it did not include items related to body image in breast cancer survivors.

### Table 1

| Variable             | n  | %       | Mean (SD) | P-value |
|----------------------|----|---------|-----------|---------|
| Marital status       |    |         |           |         |
| Single               | 44 | 21.6    | 22.31 (5.40) | 0.313  |
| Married              | 160| 78.4    | 21.36 (5.80) | 0.161  |
| Education            |    |         |           |         |
| Illiterate           | 7  | 3.4     | 22.85 (3.71) | 0.161  |
| Primary school       | 42 | 20.6    | 21.95 (5.30) | 0.421  |
| High school          | 76 | 37.3    | 20.42 (6.17) | 0.030  |
| Academic             | 79 | 38.7    | 21.57 (5.71) | 0.167  |
| Occupation           |    |         |           |         |
| Employed             | 69 | 33.8    | 22.34 (5.80) | 0.167  |
| Unemployed           | 135| 66.2    | 21.17 (5.65) | 0.421  |
| Residency            |    |         |           |         |
| Urban                | 180| 88.2    | 21.45 (5.66) | 0.073  |
| Rural                | 24 | 11.8    | 22.45 (6.18) | 0.030  |
| Number of children   |    |         |           |         |
| 0                    | 35 | 17.2    | 23.08 (6.52) | 0.073  |
| 1                    | 54 | 26.5    | 22.70 (5.27) | 0.030  |
| 2                    | 64 | 31.4    | 20.81 (5.77) | 0.001  |
| 3 and more than 3    | 51 | 24.9    | 20.29 (5.18) | 0.375  |
| Income               |    |         |           |         |
| Low                  | 90 | 44.1    | 20.60 (5.97) | 0.030  |
| Moderate             | 114| 55.9    | 22.34 (5.41) | 0.375  |
| Type of mastectomy   |    |         |           |         |
| Unilateral           | 187| 91.7    | 21.42 (5.46) | 0.030  |
| Bilateral            | 17 | 8.3     | 23.23 (8.03) | 0.375  |
| Breast prosthesis    |    |         |           |         |
| Yes                  | 38 | 18.6    | 26.23 (4.46) | 0.030  |
| No                   | 166| 81.4    | 20.50 (5.44) | 0.375  |

### Table 2

| Items                                                                 | Factor loading | $h^2$ | $\lambda$ | % of variance |
|-----------------------------------------------------------------------|----------------|-------|-----------|---------------|
| 7. I feel good about my body                                           | 0.801          | 0.642 | 3.777     | 46.557        |
| 3. I am satisfied with the way my clothes fit                          | 0.743          | 0.552 |           |               |
| 5. I am satisfied with the appearance of my breasts                    | 0.741          | 0.549 |           |               |
| 1. I feel attractive                                                   | 0.683          | 0.467 |           |               |
| 6. I am sexually attractive                                            | 0.612          | 0.374 |           |               |
| 2. During sexual activity, I feel embarrassed because of the appearance of my body | 0.600          | 0.549 |           |               |
| 4. Others consider me attractive                                       | 0.561          | 0.315 |           |               |

$h^2$: Communalities, $\lambda$: Eigenvalue

KMO test = 0.879, Bartlett’s test; $X^2 = 532.108$, df = 21, $p < 0.001$
not examine long-term breast cancer survivors [14]. As in the original version, in the exploratory factor analysis, one factor was extracted that explained nearly half of the total variance. Also, the lowest factor loading in the F-BISBS was related to item #4, and in the original version, it was related to item #2. In both versions, item #7 had the highest factor load.

Among the studied demographic variables, only financial status and having a breast prosthesis were related to body image. The mean body image score was higher in women with moderate financial status than in women with low financial status. The study by Doori et al. (2022) on women with breast cancer in Iran showed that poor economic status is related to the decrease in body image of these women [29]. The body image score in women with breast prostheses was significantly higher than in women without breast prostheses. The social importance of the breast causes women to try to correct the obvious defect of the chest caused by mastectomy by using breast prostheses (false breasts). External prostheses do not have the potential medical or surgical complications related to breast reconstruction. However, they are often associated with problems such as displacement, discomfort, and clothing restrictions. Women consider it a foreign and disturbing object that reminds them of their illness and vulnerability.

Reaby et al.’s study (1994) showed that the mean score of body image in two groups of women with prosthetics and women who had reconstruction surgery was significantly higher than in women without breast prostheses. The social importance of the breast causes women to try to correct the obvious defect of the chest caused by mastectomy by using breast prostheses (false breasts). External prostheses do not have the potential medical or surgical complications related to breast reconstruction. However, they are often associated with problems such as displacement, discomfort, and clothing restrictions. Women consider it a foreign and disturbing object that reminds them of their illness and vulnerability. Fallbjörk et al. (2013) mentioned that most women after mastectomy do not think about prostheses or reconstruction due to physical and psychological damage, fear of disease recurrence, and poor financial situation [13]. Considering the high cost of these reconstructive surgeries and implanting internal prostheses, women who turn to these methods have a better financial status, which supports our previous finding. Perceived body image influences participants’ perceptions of concepts such as spirituality and hope [31].

This study had several limitations: 1) The time of data collection coincided with the COVID-19 pandemic, so some women did not go to the clinics for pre-determined evaluations due to the fear of contracting COVID-19, and 2) The present study was conducted in Kermanshah. Given that body image can be influenced by any society’s culture, this study’s findings should be generalized with caution.

### Conclusion

The Farsi version of the body image scale for breast cancer survivors has acceptable validity and reliability. Since it has a small number of questions, it can be easily used in research and clinical settings.

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### Authors’ Contributions

HSN, NO, and HM contributed to the design and performing of the study, RM and MP conducted data gathering, HSN contributed to statistical analysis, and RGG contributed to grammar editing. All authors read and approved the final manuscript.

### Availability of Data and Materials

The datasets used and/or analyzed during the current study are available from the corresponding author upon reasonable request.

### Declarations

#### Competing interests

The authors declare that they have no competing interests.

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