



Research Article

Adaptation of the Breast Cancer Stigma Scale to Turkish

Selda Rızalar ¹, Esra Sarıbaş ², Sonay Göktaş ¹

¹University of Health Sciences, Hamidiye Nursing Faculty, Surgical Nursing Department, İstanbul, Türkiye.

²University of Health Sciences, Sultan II Abdulhamid Han Training and Research Hospital, İstanbul, Türkiye.

Cite this article as: Rızalar, S., Sarıbaş, E., Göktaş, S. (2026). Adaptation of the breast cancer stigma scale to Turkish. Northern Journal of Health Sciences, 2(3), 158-170.

Corresponding Author: Selda Rızalar

E-mail: selda.rizalar@sbu.edu.tr

ORCID:



0000 0002 1592 9926

Received: March 24, 2026

Revision Requested: September 3, 2026

Accepted: September 23, 2026

Publication Date: September 30, 2026

DOI: 10.71340/njhs.1915201

Abstract

Practical measures are needed for clinicians and researchers to identify and effectively manage stigmatization in breast cancer survivors. This study aimed to translate, cross-culturally adapt and validate the Breast Cancer Stigma Scale (BCSS) for use in Turkish. This methodological study was conducted with women with breast cancer in a hospital in İstanbul between March and October 2023. The Turkish version of the BCSS was prepared with translation, back-translation and expert review. Data were obtained using the personal information form and BCSS. Cronbach's alpha, Mc Donalds Omega analysis and item analysis were performed for reliability. Test-retest reliability was measured by intraclass correlation coefficient (ICC). CVI was determined for content validity. EFA and CFA were performed for construct validity, and fit index values were examined. Ceiling and floor effects were also evaluated. The Content Validity Index of the scale was 0.974. The item-total score correlations of the scale, which includes 15 items and four subscales, were between 0.369 and 0.663, and the factor load values were between 0.404 and 0.799. Construct validity goodness-of-fit indices were acceptable. There was a significant difference between the lower and upper 27% groups of the participants' scores from the scale for ceiling or floor effects ($p < 0.05$). Cronbach coefficient for internal consistency was 0.881. ICC was found to be high (0.952; $p = 0.000$) and there was no difference between test-retest values ($p > 0.05$). We concluded that the Turkish version of the BCSS has adequate psychometric properties as per the best international recommendations. The BCSS adapted to Turkish had good validity and reliability.

Keywords: Stigma, validity, reliability, breast cancer, scale, scale adaptation.

Özet

Bu araştırmanın amacı Meme Kanseri Damgalanma Ölçeği (MKDÖ)' ni tercüme etmek, kültürlerarası uyarlamasını yapmak ve Türkçede kullanmak için doğrulamaktır. Bu tanımlayıcı ve metodolojik çalışma, 24 Mart-12 Ekim 2023 tarihleri arasında İstanbul ilinde bir devlet Hastanesinde meme kanseri olan kadınlar üzerinde yapıldı. Meme Kanseri Stigma Ölçeği Türkçe versiyonu çeviri, geri çeviri, uzman incelemesi sonucunda hazırlandı. Veriler bireysel tanıtım formu ve MKDÖ ile elde edildi. Ölçeğin güvenirliği için Cronbach alfa incelenmesi ve madde analizi yapıldı. Test-retest güvenirliği sınıf içi korelasyon katsayısı (ICC) ile ölçüldü. İçerik geçerliği için İçerik geçerlilik indeksi (CVI) değeri belirlendi. Yapı geçerliliği için Açıklayıcı ve Doğrulamalı Faktör Analizi yapıldı, uyum indeks değerleri incelendi. Taban ve tavan etkileri de değerlendirildi. Ölçeğin CVI değeri 0.974 bulundu. On beş madde ve dört alt boyut içeren ölçeğin madde total skor korelasyonları 0.369 ile 0.663 arasında, ölçeğin faktör yükü değerleri 0.404 ile 0.799 arasındaydı. Yapı geçerliği uyum iyiliği indeksleri kabul edilebilir düzeydeydi. Tavan veya zemin etkileri için katılımcıların ölçekten aldıkları puanların alt ve üst %27' lik grupları arasında anlamlı fark olduğu belirlendi ($p < 0.05$). İç tutarlılık için yapılan Cronbach coefficient 0,881 bulundu. Ölçüm kararlılığını değerlendirmek için test retest güvenirliği ICC ile incelendi ve yüksek bulundu (0,952; $p = 0.000$). Test retest değerleri arasında fark yoktu ($p > 0.05$). MKDÖ' nin Türkçe versiyonunun en iyi uluslararası tavsiyelere uygun olarak yeterli psikometrik özelliklere sahip olduğu sonucuna vardık. Türkçe' ye uyarlanan MKDÖ' nin geçerlilik ve güvenirliği yüksek düzeydeydi.

Anahtar Kelimeler: Damgalanma, geçerlilik, güvenirlik, meme kanseri, ölçek, ölçek uyarlama.



This work is licensed under a Creative Commons Attribution 4.0 International License.

INTRODUCTION

According to 2022 data, breast cancer was the most common cancer in women in terms of both cases and deaths (Bray et al., 2024). Successful results are achieved with early diagnosis, but those living with breast cancer face many challenges as they try to recover their physical and psychosocial health following the diagnosis (Hofsø et al., 2012). The side effects of surgery, chemotherapy and radiotherapy can cause significant disfigurement and negatively affect patients' lives (Suwankhong & Liamputtong, 2016). Psychological stressors from side effects, changes in body image and others' perception of patients as "abnormal" lead to stigmatization and limitations in social interaction (Rajasooriyar et al., 2021).

According to breast cancer-related research, stigma perception is common among the patients with breast cancer (Suwankhong & Liamputtong, 2016). The prevalence of perceived cancer-related stigma ranges from 5% to 90% (Ohaeri et al., 1998; Cho et al., 2013; Phelan et al., 2013; Fujisawa et al., 2020). It is reported that approximately 76.7% of breast cancer survivors experience moderate levels of stigma, while 8.7% experience high levels of stigma (Jin et al., 2021). Sociologist Goffman defines stigma as a behaviour that devalues individuals, causing them to be perceived as less desirable, almost non-human, and ultimately discrediting them (Wang et al., 2017). Breast cancer stigma stems from the traumatic experience, factors related to the individual, the disease and the treatment as well as societal prejudices (Suwankhong & Liamputtong, 2016). Perceptions of one's own body can affect women's sense of identity, self-esteem, acceptance, sexuality and perceived stigmatization (Tripathi et al., 2017).

Extensive research has been conducted on stigma in many different diseases, but in recent years, greater attention has been placed on cancer-related stigma. Cancer is often seen as a fatal disease and people who have recovered from it are often considered "inadequate". Cancer treatment can cause both visible and invisible effects, including physical scars and stigma (Weiss et al., 2006; Yildiz & Dedeli, 2020). Since breasts are considered a symbol of physical and sexual attractiveness and femininity, a mastectomy can have serious effects on women. Women face distress and a sense of bodily disfigurement due to the absence or asymmetry of their breasts (Fang et al., 2013). Scars on a woman's body or the loss of a breast resulting from breast surgery contribute to a sense of stigmatization. Stigma causes guilt, worthlessness, exclusion, irritability, sleep issues, depression, sexual dysfunction and adaptation problems (Suwankhong & Liamputtong, 2016; Wang et al., 2017; Meacham et al., 2016). According to the evidence, stigma delays treatment, hinders access to health care, and contributes to physical, psychological, and social morbidity (Sevim, 2018). Furthermore, stigma reduces quality of life and is a significant barrier to improving health (Suwankhong & Liamputtong, 2016; Wang et al., 2017; Meacham et al., 2016).

The first step toward identifying the stigma faced by breast cancer patients and developing intervention strategies to address it is to create an assessment scale. There is currently no specific tool in our country to measure stigma directed at breast cancer survivors. However, it is important and necessary to examine stigma in breast cancer survivors in depth and to assess it with a tool that includes items specifically related to breast cancer (Bu et al., 2022). An up-to-date review of the scales used to measure stigma in breast cancer reveals that the Perceived Devaluation Discrimination (PDD) scale, the Social Impact Scale (SIS), and the Cancer Stigma Scale (CASS) have been employed (Wang et al., 2017; Çevik et al., 2022; Link et al., 1991). Turkish adaptations of the aforementioned scales have been developed to assess stigmatization in breast cancer. In addition, The Body Image after Breast Cancer Questionnaire (BIBCQ), developed by Nancy Baxter, primarily measures body image but also

includes a subscale that measures stigma which is also adapted to Turkish (Baxter, 1998; Ceylan & Rızalar, 2022). Another scale developed to measure both stigma and discrimination among Turkish patients with breast cancer is the Scale of Internalized Stigma and Perceived Discrimination in Breast Cancer Patients (Danacı, 2023).

Scales currently in use for breast cancer patients include the 12-item Breast Cancer Stigma Scale (CSS-A), developed in recent years by Dewan et al. (2020) for Arab patients, and the 15-item Breast Cancer Stigma Scale (BCSS), developed by Bu et al. (2022), for the Chinese population. However, no Turkish adaptation studies have been found for either of these scales. Undoubtedly, universal criteria may not be appropriate for all patients from different cultures who are battling breast cancer. This study aims to translate and psychometrically validate the Turkish version of the Breast Cancer Stigma Scale (BCSS) developed by Bu et al. (2022), for breast cancer survivors.

METHOD

Design and Sample

This methodological study was conducted in a Training and Research Hospital in Istanbul between March 24 and October 12, 2023 to adapt the BCSS developed by Bu et al. into Turkish. First, the process of translation of the BCSS is completed. Then, psychometric evaluation is made on the Turkish version of the BCSS. The study population consisted of female patients with breast cancer who underwent surgical intervention. The sample size was calculated considering at least ten respondents per item on the scale. Accordingly, a requirement of at least 150 (15 items x10) patients are calculated (Akgül, 2005; Güngör, 2016). The inclusion criteria for the study sample were defined as: being 18 years of age or older, having been diagnosed with breast cancer, having been undergone surgery for breast cancer, being oriented, and being able to communicate. The exclusion criteria were the presence of a psychiatric disorder and a general condition that made it impossible to complete the questionnaire. Participants were asked to complete the questionnaire individually. Data were collected from 156 patients, who had undergone surgery for breast cancer in this hospital, taking into account the possibility of data loss. Those who answered the survey incompletely, were unable to fill in the scale were excluded. In the end, survey data from 150 patients were included in the analysis. Thirty completed the same questionnaire again three weeks after the initial test to assess test-retest reliability.

Original Version of the Questionnaire

Data were collected using the patient information form and BCSS. The patient characteristics questionnaire included questions on individual and clinical characteristics. The BCSS was developed by Bu et al. (2022) and is a four-point Likert-type scale with 15 items and four subscales, according to the English validity and reliability study. There is no cut-off point, higher scores indicate a higher perception of stigmatisation. The subscales, which include self-image impairment, social isolation, discrimination, and internalised stigma contain six (items 1–6), two (items 7–8), four (items 9–12), and three (items 13–15) items, respectively. The original scale's Cronbach's α value was 0.86 overall and ranged from 0.75-0.882 for each subscale (Bu et al., 2022).

Study Procedures

Instrument translation and modification. In adapting the scale to Turkish and reviewing its validity and reliability, a back translation procedure from the original language to Turkish and from Turkish to

English was applied. The instruments were translated and adapted following the WHO guidelines (WHO guideline, 2020; Çapık et al., 2018).

Original BCSS was translated into Turkish by three independent translators with good command of Turkish and English and back-translated into English by a different translator (Karagöz, 2019 & Alpar, 2018). The scale was presented to the opinion of a thirteen-person expert committee. The experts consisted of academican nurses, clinician nurses and doctors. In the submitted form, experts were asked to evaluate the scale items in terms of comprehensibility, discrimination, purposefulness and cultural relevance. Experts were asked to rate the relevance of each scale item using a 4-point scale ranging from 1 (irrelevant) to 4 (highly relevant). The expert opinions obtained were evaluated according to the Davis technique (Davis, 1992). The content validity index (CVI) was calculated as 0.97. Following the assessment for content validity, no items were removed from the scale. Only minor changes suggested by experts were incorporated, and the form was finalized. Item 4 was as follows: "After the surgery, I feel more anxious and less confident about my appearance than before". It was corrected as follows after expert suggestion: "After the surgery, my anxiety level about my appearance increased and my self-confidence decreased compared to before." Although item 8 was "I am afraid of intimate physical contact, such as hugging., it was changed to "I avoid physical contact such as hugging" after the correction. The scale's content validity is considered to be good in terms of applicability and understandability (Polit et al., 2007).

Pilot application of the scale was performed to evaluate the applicability and comprehensibility of the scale with five patients, after which no correction was required in the scale items. Patients who participated in the pilot application were not included in the study. All statistical analyses were performed on SPSS 22.0 and AMOS (Analysis of Moment Structures statistical software). Number, percentage, mean, and SD were used for general and disease-related characteristics. The fit of numerical data to normal distribution was examined with Skewness and Kurtosis. Confirmatory Factor Analysis (CFA) was performed for construct validity. The aim of CFA was to prove the convergent, discriminant and predictive validity of a factor model using the data set obtained with the Turkish BCSS. The goodness of fit indices in CFA was examined. Reliability was evaluated using Pearson correlation and Cronbach's alpha. The internal consistency of a scale indicates whether the items on the scale are consistent with each other and with the overall scale. It also determines whether the items on the scale are understood in the same way by the participants. Reliability is the consistency between the participants' responses to the scale items (Büyüköztürk, 2011). Internal consistency was tested with item analysis. In the internal consistency analysis, Cronbach's alpha coefficients were calculated for the total scale and its subscales. McDonald's omega value was also calculated.

Temporal stability was analysed by test-retest. The values were examined for differences. Intraclass correlation coefficient (ICC) was performed and the correlation was calculated. *Scale discrimination* is done to analysed between the lower and upper 27% groups by independent groups' t-tests.

Ethical Considerations

Written permission was received via e-mail from Xiao Fan Bu for adaptation. The study was approved by the University of Health Sciences, Hamidiye Ethics Committee (Date: 30.12.2022, No:28/4) and conducted following the Declaration of Helsinki and the country's ethical standards.

RESULTS

The descriptive characteristics of the participants are presented in Table 1. Of the participants, 36% were aged 55 and over, 82% were married, and 71.3% were housewives. Of all women 56% were

primary school graduates, 71.3% had average income, 36% had additional chronic diseases, and 58.7% had a family history of cancer. Of all patients 38.7% smoked and 12.7% used alcohol, 45.3% were in the second cancer stage, and 61.3% had breast-conserving surgery. All received chemotherapy, 57.3% radiotherapy, and 99.3% targeted therapy. The time from diagnosis was 1-11 months in 65.3%, and the time from surgery was 1-6 months in 64.7%.

Table 1. Sociodemographic and clinic characteristics of the participants (n=150)

Characteristics of the Participants		n	%
Age group	18-44	46	30.7
	45-54	50	33.3
	55 years and older	54	36.0
Place of residence	City	127	84.7
	Village	23	15.3
Marital status	Married	123	82.0
	Single	27	18.0
Occupation	Housewife	107	71.3
	Civil servant	27	18.0
	Worker	7	4.7
	Self-employed	9	6.0
Working Status	No	109	72.7
	Yes	41	27.3
Education level	Primary school	84	56.0
	High school	42	28.0
	University	24	16.0
Income Level	Good	31	20.7
	Medium	107	71.3
	Poor	12	8.0
Health Insurance	Medical insurance	94	62.7
	Private insurance	12	8.0
	Not available	44	29.3
Chronic disease	Yes	54	36.0
	No	96	64.0
Family cancer history	Yes	88	58.7
	No	62	41.3
Smoking status	Yes	58	38.7
	No	92	61.3
Alcohol usage	Yes	19	12.7
	No	131	87.3
Stage of breast cancer	I	34	22.7
	II	68	45.3
	III	34	22.7
	IV	14	9.3
Surgery type	Breast conserving surgery	92	61.4
	Modified radical mastectomy	41	27.3
	Mastectomy and breast reconstruction	17	11.3
Chemotherapy	Yes	150	100
	No	0	00.0
Radiotherapy	Yes	86	57.3

	No	64	42.7
Chemotherapy+ Targeted therapy	Yes	149	99.3
	No	1	0.7
Time since diagnosis (months)	<1	3	2.0
	1-11	98	65.3
	12-23	30	20.0
	≥ 24	19	12.7
Time since surgery (months)	<1	10	6.7
	1-6	97	64.7
	7-11	29	19.3
	≥ 12	14	9.3
Feeling knowledgeable about the disease	Partially knowledgeable	75	50.0
	Knowledgeable	75	50.0

Reliability

Cronbach's alpha, item analysis and test re-test analysis were used to evaluate reliability. Cronbach alpha reliability was calculated for the BCSS total and subscales. In the internal consistency analysis, Cronbach alpha coefficients were 0.881 for the total scale and 0.756-0.814 for the subscales (Table 2). The Spearman-Brown Coefficient was 0.875. McDonald's Omega coefficient is 0.879, providing additional evidence of the internal consistency of the scale.

Table 2. Reliability analysis for subscales of the BCSS

Subdimensions	Item	Item-Sub-Dimension Total Score Correlation Coefficient	Corrected Item-Total Correlation	Cronbach's Alpha If Item Deleted	Factor Loadings	Alpha
		r	r			
Body Image Impairment	1	0.376	0.391	0.881	0.827	0.814
	2	0.658	0.652	0.869	0.558	
	3	0.658	0.625	.870	0.638	
	4	0.688	0.650	0.869	0.498	
	5	0.614	0.588	0.871	0.769	
	6	0.469	0.369	0.881	0.733	
Social Isolation	7	0.364	0.429	0.878	0.616	0.756
	8	0.406	0.559	0.873	0.624	
Discrimination	9	0.411	0.452	0.877	0.883	0.779
	10	0.592	0.569	0.872	0.480	
	11	0.533	0.499	0.875	0.488	
	12	0.424	0.506	0.875	0.725	
Internalized Stigma	13	0.601	0.571	0.872	0.737	0.786
	14	0.587	0.663	0.868	0.641	
	15	0.695	0.624	0.870	0.799	

For reliability, the items' effect on internal consistency was evaluated using item analysis. The 15 item-total score correlations demonstrated reliability coefficients between 0.391-0.663. The correlation between the item scores and the total scale was positive and statistically significant ($p < 0.001$). All corrected item correlation values for the Body Image Impairment ($r = 0.369$ - 0.652), Social Isolation (0.429 - 0.559), Discrimination ($r = 0.452$ - 0.569), and Internalized Stigma ($r = 0.571$ - 0.663) subscales were positive and statistically significant. Item-subscale total score correlations of the BCSS subscales showed that all were 0.30 and positive. For all four subscales, no significant increase in reliability coefficients was detected when the item was removed. According to our findings, the analysis included all BCSS items, and no items were omitted.

Floor and ceiling effects involve item analyses conducted to examine the discrimination levels of an item and their contribution to internal consistency. The mean scores of the upper and lower 27% groups were evaluated. The scale is expected to distinguish between the two extreme groups clearly and it showed a significant difference between the two groups ($p < 0.05$) and made precise measurements for discrimination.

Since the temporal stability of the scale is also important, an evaluation was conducted. To evaluate the consistency of the tool over time, test-retest reliability was examined through the Intraclass Correlation Coefficient (ICC), yielding high correlation values ($r = 0.952$; $p = 0.000$) (Table 3). An ICC greater than 0.70 indicates that the two tests have the desired test-retest reliability. No difference was found between test-retest values ($p > 0.05$), and it is seen that the scale makes reliable measurements in a short time.

Table 3. Comparison of test and re-test mean scores of breast cancer stigma scale and sub-dimensions, and correlations ($n = 30$)

Breast Cancer Stigma Scale	Test ($n = 150$)	Re- Test ($n = 30$)	t	p^a	ICC ^b	p
	Mean $\pm$ SD	Mean $\pm$ SD				
Total	35.000 $\pm$ 8.408	34.967 $\pm$ 8.426	0.441	0.662	0.952	0.000
Body Image Impairment	15.633 $\pm$ 3.672	15.700 $\pm$ 3.602	-0.626	0.536	0.936	0.000
Social Isolation	4.300 $\pm$ 1.622	4.267 $\pm$ 1.574	0.441	0.662	0.924	0.000
Discrimination	8.533 $\pm$ 2.649	8.467 $\pm$ 2.636	1.439	0.161	0.926	0.000
Internalized Stigma	6.533 $\pm$ 2.713	6.633 $\pm$ 2.684	-1.361	0.184	0.937	0.000

^aDependent Group T-Testi, ^bIntraclass Correlation Coefficient

Content and structure validity were examined for validity. For content validity, 13 experts were asked to provide opinions after translation and back-translation. The Content Validity Index (CVI) was 0.974.

Explanatory Factor analysis (EFA) and Confirmatory Factor Analysis were evaluated for construct validity. To assess factorizability, the Kaiser-Meyer-Olkin (KMO) test and Bartlett's sphericity test were used prior to EFA. The KMO coefficient, which is a measure of sample adequacy, was found to be 0.851. It was determined that the sample size was sufficient for conducting factor analysis. The results of the Bartlett test ($p=0.000<0.05$) indicated that the sample was suitable for factor analysis (Alpar, 2018). The scale items and their factor loadings are presented in Table 2. The factor loadings obtained as a result of confirmatory factor analysis of all items were between 0.404 and 0.799. The factor loadings of the subscales are as follows: F1: 0.404-0.789, F2: 0.448-0.591, F3: 0.505-0.700, F4: 0.687-0.799. When the scale was analyzed as a four-factor structure, consistent with the original structure, it was determined that the factor loadings of all items on the scale were above 0.40 and that the explained variance was 63.864%. Therefore, no items were removed from the scale at this stage, and the four-factor structure was accepted.

CFA was used for the construct validity of the BCSS to evaluate the construct validity and confirm the factor structure using the data set obtained with the adapted scale. The factor loadings obtained as a result of confirmatory factor analysis (CFA) of all items were between 0.404 and 0.799. We wanted to verify the fit of the components. The goodness of fit indices, frequently used in the literature, were used in the study. The goodness-of-fit criteria for CFA, conducted with a total of 15 items, are given in Table 4. The goodness of fit indices were $\chi^2/SD=2.15$, GFI =0.90, AGFI=0.90, CFI=0.90, RMSEA=0.08, RMR=0.05. Our analysis findings regarding the validity of the BCSS showed an acceptable fit.

Table 4. Fit indices of CFA findings of the breast cancer stigma scale

Indices	Normal Indices*	Acceptable Value**	CFA Fit Indices
χ^2/SD	<2	<5	2.15
GFI	>0.95	>0.90	0.90
AGFI	>0.95	>0.90	0.90
CFI	>0.95	>0.90	0.90
RMSEA	<0.05	<0.08	0.08
RMR	<0.05	<0.08	0.05

χ^2 : Chi square; SD: degrees of freedom; GFI: goodness-of-fit index; AGFI: adjusted goodness-of-fit index.

CFI: comparative fit index; RMSEA: root-mean-square error of approximation; RMR: Root Mean Square Residual

Figure 1 shows the path diagram for confirmatory factor analysis. Accordingly, there were statistically significant items in all subscales. Standardised factor loadings on the four subscales were positive. According to our findings, BCSS items are validly included in the relevant subscales. Subscales in BCSS after CFA were named self-image impairment (F1), social isolation (F2), discrimination (F3), and internalised stigma (F4). When the standardised coefficients were examined, the factor loadings were high, the standard error values were low, and the t-values were significant. These results confirmed the construct validity of the previously determined factor structure.

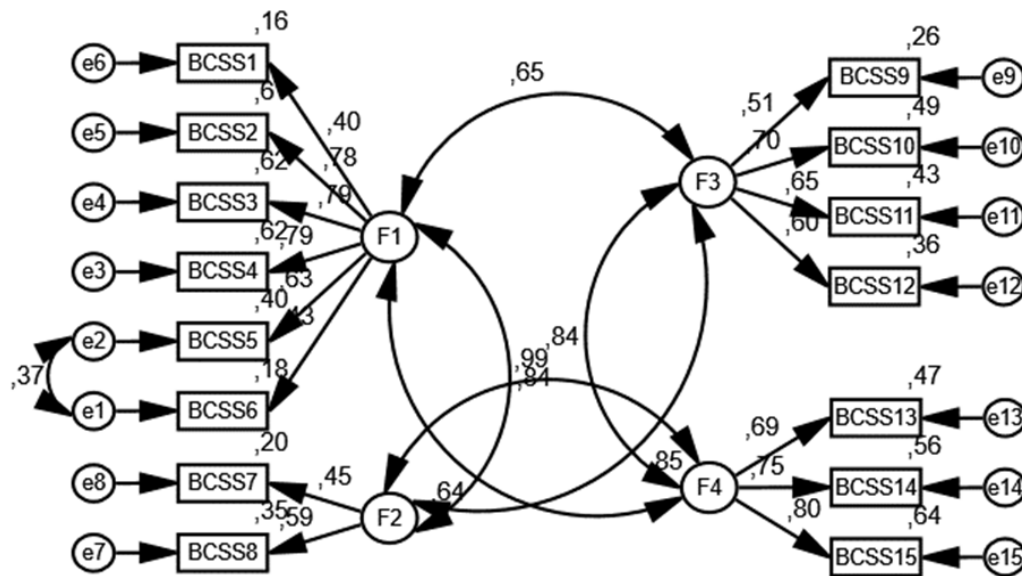


Figure 1: Confirmatory factor analysis diagram

DISCUSSION

In Turkish culture, stigma refers to the exclusion, marginalization, and devaluation of an individual due to characteristics that do not conform to society's generally accepted norms. In the Turkish social structure, where collective and relational bonds are very strong, stigmatization is a dynamic that affects not only the individual but often the entire family. The primary areas where illness-related stigma is most prevalent in Turkish culture include psychiatric disorders, infectious and chronic diseases, sexuality, and a history of crime and punishment. Until recently, various scales (PDD, SIS, CASS) have been used to measure stigma associated with breast cancer. In this study, the psychometric properties of the BCSS were examined to better identify stigma among Turkish women with breast cancer.

Item analysis, Cronbach's alpha, McDonalds omega and test-retest were used for the reliability analysis of the BCSS. Cronbach's alpha reliability was calculated for the BCSS total and subscales. In the internal consistency analysis, Cronbach's alpha coefficients were 0.881 for the total scale and 0.756-0.814 for the subscales. Our findings demonstrated good reliability levels for all subscales. The original form and Turkish versions had similar Cr alpha values (Bu et al., 2022). The Breast Cancer Stigma Scale for use with Arab patient populations (BCSS-A), consisting of a 12-item questionnaire, was using a sample of 59 women (Dewan et al., 2020). The Cronbach's alpha coefficient of the BCSS-A was 0.79. Our findings also showed a high level of internal consistency for the Turkish version of the scale (Karagöz, 2019; Alpar, 2018; Kartal & Bardakçı, 2018). McDonald's Omega coefficient is 0.879, providing additional evidence of the internal consistency of the scale.

For reliability, the items' effects on internal consistency were analysed. Item-total score correlations of 15 items were examined, and reliability coefficients between 0.391-0.663 were found. The correlation between item scores and the total survey was positive and statistically significant. All item-subscale total score correlations of the BCSS subscales were positive and above 0.30. A correlation coefficient of 0.3 or above for an item in the scale indicates that it is highly discriminative (Büyüköztürk, 2011). The responses to the items had a positive correlation between the items and the total of the scale, showing that the participants understood the propositions correctly and responded objectively.

Positive items with item-total correlation coefficient values above 0.30 should remain on the scale (Karagöz, 2019; Kartal & Bardakçı, 2018). The higher the correlation coefficient, the better the materials' reliability (Gözüm & Aksayan, 2003; Akgül & Çevik, 2003). The test-retest reliability coefficient for the 15-item Breast Cancer Stigma Scale and that of factors were all above 0.75 (Bu et al., 2022).

Each subscale of the BCSS met the criteria. Ceiling and floor effects (Comparison of the upper and lower 27% groups) were evaluated for item discrimination analysis distinctiveness. The scale is expected to clearly distinguish between the two extreme groups. A significant difference between the scores of the groups indicates discrimination (Tezbaşaran, 2008). There was a significant difference between the two groups ($p < 0.05$), and the scale provides sensitive, consistent and discriminatory measurements.

Test-retest reliability was examined through ICC to evaluate measurement stability, demonstrating high correlation values ($r = 0.952$; $p = 0.000$). An ICC greater than 0.70 indicates that the two tests have the desired reliability. No difference was detected between test-retest values ($p < 0.05$), showing that the scale makes reliable measurements over a short period of time (Gözüm & Aksayan, 2003; Akgül & Çevik, 2003).

For scale validity, content and construct validity were examined. First, language validity was achieved through translation and back-translation, then content validity through expert opinion. CVI value was 0.974. Values above 0.80 ensure validity (Chen et al., 2020). The 15 Item scale comprises four factors: self-image impairment, social isolation, discrimination, and internalized stigma. The scores of the expert consultation indicated that the scale has adequate content validity.

The Breast Cancer Stigma Scale for use with Arab patient populations (BCSS-A), consisting of a 12-item survey, was using a sample of 59 women (Dewan et al., 2020). The the content validity of S-CVI was 1.0, and the item-CVI ranged from 0.85 to 1.0. The BCSS-A mostly focuses on health-related stigma: perceived danger, blame, concealability, disruptiveness, esthetics, and shaming and devaluation of patients or their families. However, most of the participants were married. Therefore, it is difficult to generalize their findings to single women.

Stigma can manifest at various stages of the disease process. It can lead to decreased self-esteem, depression, and a tendency towards social isolation. This can hinder recovery at any stage of the illness and lead to changes in social roles, acceptance, and employment difficulties. Therefore, accurate assessment of breast cancer-related stigma is crucial for the patient's benefit.

In adapting the BCSS to Turkish, CFA was used to verify the fit of the components for construct validity. CFA aims to obtain evidence of a factor model's convergent, discriminant, and predictive validity using the data set obtained with the adapted scale (Jex et al., 2008).

The goodness of fit indices in CFA should be set to the desired level. The fit of the data to the created model is tested with chi-square fit statistics. If the chi-square value divided by degrees of freedom is between 2 and 5, the fit is considered acceptable. This value indicates a good fit between covariance structures. In our finding, the Chi-square value ($\chi^2/SD = 2.5$) shows the model has acceptable goodness of fit (Sumer, 2000). The commonly used goodness-of-fit indices, GFI, AGFI, CFI, RMSEA and RMR, were analysed in the study. The found values were acceptable. Our findings regarding the validity of the BCSS showed a generally acceptable fit. Our analysis results showed that the fit values calculated with CFA were consistent with the previously determined factor structure of the scale (WHO guideline, 2020; Tabachnick & Fidell, 2013).

The diagram for confirmatory factor analysis is given in Figure 1. In the analysis, there were statistically significant items in all subscales. Standardised factor loadings on the four subscales were positive. According to our findings, BCSS items were valid in the corresponding subscales. When the standardised factor loadings and t values were examined, it was determined that the factor loadings were high, standard error values were low, and t values were significant. These results confirm the construct validity of the previously determined factor structure.

According to our findings from factor analysis, the Breast Cancer Stigma Scale (BCSS) has an acceptable component structure. Our other findings also demonstrated a high level of predicted internal consistency and test-retest reliability. These results show that the 15-item scale is a valid and reliable tool for assessing stigma in Turkish breast cancer patients. Therefore, the BCSS can be used as a suitable measurement tool to assess perceived stigma among women with breast cancer in Türkiye.

Nurses often play a critical role in the early identification and management of stigmatization in breast cancer survivors. The Turkish version of the BCSS can be a valuable questionnaire for nurses. Early identification of stigma signs allows for timely interventions, which can improve the woman's overall health. In the future, research could be conducted to evaluate the effectiveness of nursing interventions aimed at reducing stigma among women with breast cancer. The impact of intervention programs that take patients' cultural characteristics into account could be assessed. Incorporating the use of this assessment questionnaire into nursing education can enhance the competency of nursing students in recognizing and addressing stigma in breast cancer.

CONCLUSION

The validity and reliability of the BCSS adapted from English to Turkish were found to be good. With four subscales and 15 items, the scale was shown to be valid and reliable. BCSS can be used to measure the stigmatisation of Turkish women with breast cancer during surgery and other treatment processes.

Declaration of Interests: The authors declare that there is no conflict of interest.

Financial Support: This research did not receive support from any funding agency/industry

Ethical Approval: Ethics committee approval was received for this study from the University of Health Sciences, Hamidiye Ethics Committee of Health Sciences University (Date: 30.12.2022, Number:28/4).

Author Contributions: Idea-SR; Design-SR, ES, SG; Supervision- SR, SG; Sources- SR, ES, SG; Data Collection and/or Processing-ES; Analysis and/or Interpretation- SR, ES, SG; Literature Review- SR, ES; Writing the study- SR, ES; Critical Review- SR, SG.

REFERENCES

- Akgül, A. (2005). Factor analysis. *Statistical Analysis Techniques in medical research. SPSS implementations*, 2.Ed, pp: 441.
- Akgül, A., & Çevik, O. (2003). *Statistical Analysis Techniques*. Ankara: Emek Ofset Ltd. Şti. pp. 417-23.
- Alpar, R. (2018). *Applied Statistics and Validity-Reliability with Examples from Sports, Health and Education Sciences*. Ankara: Detay.
- Baxter, N.N. (1998). *The Body Image after Breast Cancer Questionnaire the design and testing of a disease specific measure. A thesis submitted in conformity with the requirements for the degree of Doctor of Philosophy Graduate Department of Medical Sciences University of Toronto*.
- Beaton, D.E., Bombardier, C., Guillemin, F., & Ferraz, M.B. (2000). Guidelines for the process of cross-cultural adaptation of self-report measures. *Spine (Phila Pa 1976)*. 2000;25(24):3186-91. <https://doi.org/10.1097/00007632-200012150-00014>.
- Bray, F., Laversanne, M., Sung, H., Ferlay, J., Siegel, R.L., Soerjomataram, I. & Jemal, A. (2024). Global cancer statistics 2022: GLOBOCAN estimates of incidence and mortality worldwide for 36 cancers in 185 countries. *CA Cancer J Clin*.74(3):229-263. doi: 10.3322/caac.21834. Epub 2024 Apr 4. PMID: 38572751.
- Bu, X., Li, S., Cheng, A.S.K., Ng, P.H.F., Xu, X., Xia, Y., & Liu, X. (2022). Breast Cancer Stigma Scale: A reliable and valid stigma measure for patients with breast cancer. *Front Psychol*. Jun 10;13:841280. doi: 10.3389/fpsyg.2022.841280. PMID: 35756211; PMCID: PMC9226439.
- Büyüköztürk, Ş., (2011). *Handbook of data analysis for social sciences*. Ankara: Pegem Publish.
- Ceylan, E., Rizalar, S. (2022). Turkish validity and reliability of body image after breast cancer questionnaire. *J Educ Res Nurs*.19(2):182-190.
- Chen, Y., Li, Z., Peng, J., Shen, L., & Shi, J. (2020). Development of a Care Bundle for Stroke Survivors with Psychological Symptoms: Evidence Summary and Delphi Study. *Evid Based Complement Alternat Med*. 2020:7836024. Published 2020 Jun 29. doi:10.1155/2020/7836024.
- Cho, J., Choi, E.K., Kim, S.Y., Shin, D.W., Cho, B.L., Kim, C.H., et.al. (2013). Association between cancer stigma and depression among cancer survivors: a nationwide survey in Korea, *Psychooncology*, 22, 2372–2378. doi: 10.1002/pon.3302
- Çapık, C., Gözümlü, S., & Aksayan, S. (2018). Stages of intercultural scale adaptation, language and cultural adaptation: an updated guide. *Florence Nightingale J Nurs*.26(3):199-210.
- Çevik, B., Kav, S., Kaynar, P., Sahin, Z.K., Tekcan, B., & Ülker, Ş. (2023). Turkish validity and reliability of the Cancer Stigma Scale (CASS-T). *Palliat Support Care*. 2023 Feb;21(1):100-107. doi: 10.1017/S1478951522000554. PMID: 35699122.
- Danacı, E. (2023). Meme kanseri hastalarında içselleştirilmiş stigmatizasyon ve ayrımcılık algısının belirlenmesi: bir ölçek geliştirme çalışması Ondokuz Mayıs Üniversitesi, Lisansüstü Eğitim Enstitüsü, Samsun.
- Davis, L.L.(1992). "Instrument review: Getting the most from a panel of experts". *Applied Nursing Research*. 5: 194-197.
- Dewan, M., Hassounah D., Song M., & Lyons K. S. (2020). Development of the breast cancer stigma scale for arab patients. *Asia Pacific J. Oncol. Nurs*. 7 295–300. 10.4103/apjon.apjon_14_20.
- Fang, S. Y., Shu, B. C., & Chang, Y. J. (2013). The effect of breast reconstruction surgery on body image among women after mastectomy: a meta-analysis. *Breast cancer research and treatment*, 137(1), 13–21. <https://doi.org/10.1007/s10549-012-2349-1>
- Fujisawa, D., Umezawa, S., Fujimori, M., & Miyashita, M. (2020). Prevalence and associated factors of perceived cancer-related stigma in Japanese cancer survivors. *Jpn. J. Clin. Oncol*. 50 1325–1329. 10.1093/jjco/hyaa135.
- Gözüm S, & Aksayan S. (2003). A guide for transcultural adaptation of the scale II: psychometric characteristics and cross-cultural comparisons. *Turk J Nurs Res*. 5:3-14.
- Güngör, D. A guide to the development and adaptation of measurement instruments in psychology. *Turkish Psychology Articles*. 2016;19(38):104-112.
- Hofsø, K., Miaskowski, C., Bjordal, K., Cooper, B.A. & Rustøen, T. (2012). Previous Chemotherapy influences the symptom experience and quality of life of women with breast cancer before radiation therapy. *Cancer Nurs*. 35: 167-177.
- Jex, S.M. Britt, T.W. (2008). *Organizational Psychology. A scientist-Practitioner Approach*. Nex Jersey: John Wiley&Sons. 211-245.
- Jin, R., Xie, T., Zhang, L., Gong, N., & Zhang, J. (2021). Stigma and its influencing factors among breast cancer survivors in China: A cross-sectional study. *European journal of oncology nursing : the official journal of European Oncology Nursing Society*, 52, 101972. <https://doi.org/10.1016/j.ejon.2021.101972>
- Karagöz, Y. (2019). *Spss Amos Meta Applied Statistical Analysis*. Çankaya: Nobel Academic.
- Kartal, M., Bardakçı, S.(2018). *Reliability and Validity Analyses in Applied Examples of SPSS and AMOS*. Ankara: Akademisyen Kitapevi.
- Link, B. G., Mirotnik, J., & Cullen, F. T. (1991). The effectiveness of stigma coping orientations: can negative consequences of mental illness labeling be avoided? *J. Health Soc. Behav*. 32 302–320. 10.2307/2136810.

- Link, B. G., Struening, E. L., Neese-Todd S., Asmussen, S., & Phelan, J. C. (2001). The consequences of stigma for the self-esteem of people with mental illnesses. *Psychiatr. Serv.* 52 1621–1626. 10.1176/appi.ps.52.12.1621
- Meacham, E., Orem, J., Nakigudde, G., Zujewski, J.A., & Rao, D. (2016). Exploring stigma as a barrier to cancer service engagement with breast cancer survivors in Kampala, Uganda.. 25:1206-1211.
- Ohaeri, J.U., Campbell, O.B., Ilesanmil, A.O. & Ohaeri, B.M.(1998). Göğüs ve serviks kanseri olan Nijeryalı kadınların psikososyal kaygıları. *Psiko Onkol.* 7, 494–501. doi: 10.1002/(SICI)1099-1611(199811/12)7:6<494::AID-PON331>3.0.CO;2-W.
- Phelan, S. M., Griffin, J. M., Jackson, G. L., Zafar, S. Y., Hellerstedt, W., Stahre, M., et al. (2013). Stigma, perceived blame, self-blame, and depressive symptoms in men with colorectal cancer. *Psycho Oncol.* 22 65–73. 10.1002/pon.2048.
- Polit, D. F., Beek, C. T., & Owen, & S. V. (2007). Is the CVI an acceptable indicator of content validity? Appraisal and recommendations. *Res. Nurs. Health* 30 459–467. 10.1002/nur.20199.
- Rajasooriyar, C. I., Kumar, R., Sriskandarajah, M. H., Gnanathayalan S. W., Kelly J., & Sabesan S. (2021). Exploring the psychosocial morbidity of women undergoing chemotherapy for breast cancer in a post-war setting: experiences of Northern Sri Lankan women. *Supportive Care Cancer* 29 7403–7409. 10.1007/s00520-021-06296-5.
- Sevim K. (2018). Stigma and women from a social work perspective. *Bingöl University Social Sciences Institute Journal.* (15):469-480.
- Sumer, N. (2000). Structural equation modeling: Basic concepts and applications. *Turkish Psychology Articles* 2000; 3:49-74.
- Suwankhong, D., & Liamputtong, P. (2016). Breast cancer treatment: experiences of changes and social stigma among thai women in southern Thailand. *Cancer Nurs.* 39:213-220.
- Tabachnick, BG. & Fidell, L.S. (2013). *A Practical Approach to using Multivariate Statistics* (sixth ed.) Pearson Education.
- Tezbaşaran, A.A. (2008). Likert-type scale preparation guide (e-book). <http://www.academia.edu/1288035/LikertTipiÖlçekHazırlamaKılavuzu> accessed from.
- Tripathi, L., Datta, S.S., Agrawal, S. K., Chatterjee, S., & Ahmed, R. (2017). Stigma perceived by women following surgery for breast cancer. *Indian J. Med. Paediatr. Oncol.* 38 146–152. 10.4103/ijmpo.ijmpo_74_16.
- Wang, Q.X., Bai, Y., Lu, G.F., & Zhang, C.Y. (2017). Perceived health-related stigma among patients with breast cancer. *Chin Nurs Res.*, 4:158-161. <https://doi.org/10.1016/j.cnre.2017.10.002>.
- Weiss, M.G., Ramakrishna, J., & Somma, D. (2006). Health-related stigma: rethinking concepts and interventions. *Psychol Health Med.*, 11:277-287.
- World Health Organization. Process of translation and adaptation of instruments. [cited on Oct 12, 2020] Available from: http://www.who.int/substance_abuse/research_tools/translation/en/
- Yildiz, E. & Dedeli, Ç.Ö. (2020). Systematic review: a systematic analysis of research on stigma towards cancer patients. *Health and Society.* 1: 9-25.