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Turkish Validity and Reliability Study of Breast Cancer Self-Efficacy Survivor Scale

Meme Kanseri Sağ Kalım Öz Yeterlik Ölçeği'nin Türkçe Geçerlik ve Güvenirlik Çalışması

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ABSTRACT

The purpose of this research was to define the Turkish validity and reliability of the Breast Cancer Self-Efficacy Survivor Scale. The study was methodological design and was carried out in the breast clinic of a university hospital between January-May 2023 in Istanbul. The study included 217 women who were survivor after breast cancer. The scale contains one dimension, eleven items, and is scored on a five-point Likert scale. Translation-back-translation method was used for language equivalence, expert opinion received, and Exploratory and Confirmatory Factor Analysis were performed for construct validity. Cronbach's α was applied for internal consistency analysis, while Pearson correlation was used for item-total score correlation. The retest was conducted with 55 participants 3 weeks after the initial data collection. Intraclass Correlation Coefficient (ICC) was estimated for test-retest reliability. General Self-Efficacy Scale was used for the convergent validity of the scale. Content Validity Index and Cronbach α reliability coefficient of the scale adapted to Turkish as a result of expert opinions came out to be 0.969, and 0.852 respectively. The correlation coefficients of the scale items were calculated between 0.50 to 0.61. Factor analysis revealed that 11 items with eigenvalues greater than 1 were grouped under 2 factors. Confirmatory factor analysis validated this structure. The study concluded that the Breast Cancer Survivorship Self-Efficacy Scale is a valid and reliable measurement instrument in Turkish society.

Keywords: Breast Cancer, Survivor, Self-Efficacy, Validity, Reliability

ÖZ

Bu araştırmanın amacı Meme Kanseri Sağ Kalım Öz Yeterlik Ölçeği'nin Türkçe geçerlik ve güvenirliğinin yapılmasıdır. Metodolojik tasarımda planlanan araştırma, İstanbul'da bir üniversite hastanesinin meme kliniğinde Ocak-Mayıs 2023 tarihleri arasında gerçekleştirildi. Araştırmaya meme kanseri tedavisi sonrası sağ kalım sürecinde olan 217 kadın dahil edildi. Ölçek 11 madde ve tek boyuttan oluşmakta olup beşli likert şeklinde değerlendirilmektedir. Ölçek dil eşdeğerliği için çeviri geri-çeviri yöntemi uygulandı. Kapsam geçerliği için, uzman görüşü alındı. Yapı geçerliği için Açıklayıcı ve Doğrulayıcı Faktör Analizi kullanıldı. İç tutarlılık için Cronbach's α ve madde toplam puan korelasyonu için Pearson korelasyon analizi yapıldı. Tekrar test için, ilk veri toplanmasından 3 hafta sonra 55 katılımcıya ölçek tekrar uygulandı. Test-tekrar test güvenilirliği için Sınıf İçi Korelasyon Katsayısı (ICC) hesaplandı. Ölçeğin yakınsama geçerliliği için Genel Öz Yeterlilik Ölçeği kullanıldı. Türkçe'ye uyarlanan ölçeğin uzman görüşleri sonucu Kapsam Geçerlilik İndeksi 0.969, Cronbach's α güvenirlik katsayısı 0,852 olarak belirlendi. Ölçek maddelerinin korelasyon katsayıları 0.50-0.61 arasında olduğu hesaplandı. Faktör analizinde öz değeri 1'den büyük 11 maddenin 2 faktör altında toplandığı saptandı. Doğrulayıcı faktör analizi ile bu yapı doğrulandı. Araştırma sonucunda meme kanseri sonrası sağ kalım sürecindeki bireylerde Meme Kanseri Sağ Kalım Öz Yeterlik Ölçeği'nin geçerli ve güvenilir bir araç olarak saptandı.

Anahtar Kelimeler: Meme Kanseri, Sağ Kalım, Öz Yeterlik, Geçerlik, Güvenirlik

Ethics committee approval was obtained from Acıbadem University and Acıbadem Healthcare Institutions Medical Research Ethics Committee (Date:30/12/2022 Decision No:ATADEK- 22/20).

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INTRODUCTION

An individual who survives from the time of cancer diagnosis until the end of life is considered a "Survivor". According to the American Cancer Society, survivor is used for all individuals diagnosed with cancer, individuals who have been diagnosed with cancer for several years after diagnosis or individuals who have completed cancer treatment.[1] According to the National Cancer Institute, an individual is considered to be a survivor for their entire life from the moment they are diagnosed with cancer.[2] By another opinion, surviver is defined as individuals who survive for five years after being diagnosed with cancer.[3] There are currently more than 3.8 million breast cancer survivors in the US. According to 2018 data, the survival rate for breast cancer in women is 83% among cancer diagnoses.[4]

Most breast cancer survivors are affected physically, psychosocially and spiritually as a result of their diagnosis and cancer treatment.[5] One study determined that most survivors had both physical and psychological problems such as sleep disturbance, pain, depressive symptoms, anxiety, fatigue, and sexual dysfunction.[6] In addition to these problems, patients also experience concern and anxiety about the recurrence of cancer.[7] Survivors' problems include general quality of life issues.[8,9] Self-efficacy has been noted as an effective factor in the development of interventions that enable survivors to manage their symptoms and enhance their overall well-being. The ability of a woman to react to illness and treatment is boosted by self-efficacy.[10]

Self-efficacy is described as a person's belief in his or her own capacity to perform a certain activity. In other words, based on self-efficacy theory, people will typically do what they think will succeed and avoid trying what they believe will fail. It also indicates the effort expended for a particular problem. Self-efficacy plays a central role in behavior change by influencing the length of time it takes an individual to sustain a behavior to achieve an expected outcome.[11,12] It was determined that high self-efficacy beliefs were associated with positive thoughts about being healthy, while low self-efficacy beliefs were associated with depression and relapse anxiety.[9] For example, if a breast cancer survivor has low self-efficacy beliefs about an exercise program, this may lead to lack of exercise, increased fatigue, and reduced quality of life.[8] Self-efficacy enables individuals to manage and reduce symptoms and adverse effects. It also promotes more effective self-care activities. It is emphasized that interventions to increase self-efficacy reduce the frequency of physical and psychological problems in survivors.[10]

Breast cancer survivors have psychosocial and physiological early and late complications.[8] Continuous advances in early detection and diagnosis, medical technology, multimodal therapies and treatment effectiveness have greatly improved breast cancer survivor rates. Given that, there is a need to develop effective interventions for the management of psychosocial problems faced by survivors.[13] What is known about survivors' self-efficacy and how they manage problems in the year following treatment is inadequate.[9] Cancer-related self-efficacy scales assess acute effects of cancer therapies like surgery or chemotherapy, such as pain, nausea and alopecia.[8]

In our country, survivorship programmes are still newly structured also survivor care plan use is not yet widespread. Self-efficacy state in survivor women is very important for the effectiveness of survival follow-up programmes and planning of nursing interventions. In Turkey, there is no valid and reliable measurement scale to assess self-efficacy in breast cancer survivors. The aim of this study was to conduct the Turkish validity and reliability of the Breast Cancer Self-Efficacy Survivor Scale to assess the self-efficacy of individuals in the breast cancer survivors and to adapt the scale.

MATERIALS AND METHODS

Study Design and Population

The study utilized a methodological design. The population of the study consisted of women who were followed up in the breast clinic of a university hospital in Istanbul and who were breast cancer survivors. For scale validity and reliability studies, the sample size ought to be 5-10 times the total amount of items.[14] Women who met the inclusion criteria provided data. The inclusion criteria were being ≥18 years age, able to read and speak Turkish, at least 6 months passed after breast cancer treatment. Exclusion criteria were having comorbid psychiatric diagnosis with cancer diagnosis and history of other cancers or metastases during the moment of data collection. In this context, the study was completed with 217 breast cancer survivors.

Data Collection Tools

Data were collected with the Survivor Information Form, the Breast Cancer Self-Efficacy Survivor Scale, and the General Self-Efficacy Scale. The Survivor Information Form was developed by the researchers and contained demographic information about women (age, education, marital status, working status etc.).

Breast Cancer Self-Efficacy Survivor Scale (BCSES)

The scale created by Champion et al. to assess the self-efficacy of survivors consists of 11 items. The scale is a 5-point Likert scale with values ranging from 11 to 55, with higher values indicating a high level of self-efficacy. There is no scale cut-off point. The scale has no inverse items. The scale is unidimensional and the Cronbach's α value is 0.89.[8]

General Self-Efficacy Scale (GSES)

Schwarzer and Jerusalem created the scale to assess people's levels of self-efficacy. Aypay completed the scale's Turkish validity and reliability research.[15,16] The scale 10 items. The scale is a 4-point Likert scale with values ranging from 10 to 40, with higher values showing a high point of self-efficacy. Cronbach's α was 0.83 in the validity and reliability assessment of the measure.[16] This scale was used to determine convergent validity. Convergent validity was determined by comparing the items of the generated scale to the items of the scale/scale assessing a related but distinct conceptual notion.[14]

Data Collection Method

The researchers collected the data face-to-face between January and May 2023. The scales took about 15 minutes to fill in.

Phases of the Research

Validity Analysis

Content, construct and convergent validity techniques were used in this adaptation study.

Translation of the Scale

Two independent linguists translated The scale from English into Turkish. The researchers then worked together to create the Turkish version of the scale. Later, the Turkish version was translated into English by two another linguists.

Content Validity

For the scale's content validity and compatibility to Turkish culture, 10 experts were consulted for their opinion, consisting of academicians and clinicians - academician in nursing (6), medical oncologist (1), breast surgeon (1), oncology clinical nurse (2) working in oncology. Each item was evaluated on a 4-point scale by the experts for appropriateness and comprehensibility ("very appropriate=4", "appropriate but needs minor modification=3", "the item should be modified in an appropriate form=2" and "not appropriate=1"). The content validity index (CVI) was calculated using the Davis technique. A CVI >0.80 refers to adequate content validity.[17]

Pilot Study

A pilot research was carried out to assess both language translation and content

comprehensibility. It is suggested that the pilot research be conducted with 20-30 people who have similar characteristics.[14] The pilot study was conducted with 20 survivors with similar sample characteristics. As a result, both the language and the substance of the scale items were understandable. The 20 survivors were not contain in the study's sample.

Reliability of the Scale

Cronbach's α was computed through the internal consistency examination to identify the scale's dependability. For item total score correlation, Pearson correlation analysis was carried out. Intraclass Correlation Coefficient (ICC) was computed for test-retest reliability. The retest was conducted with 55 participants 3 weeks after the initial data collection.

Construct Validity

For the construct validity of the scale, exploratory and confirmatory factor analyses were utilized.

Convergent Validity

Convergent validity is a type of construct validity that examines the relationships between the scores of two different scales that measure conceptually the same or similar characteristics. The Pearson correlation coefficient between scales measuring similar characteristics should be at least 0.30.[18] GSES was utilized for the convergent validity of the scale.

Data Analysis

Number, percentage and average analyses were performed for descriptive data. SPSS (IBM Corp., Armonk, NY, USA) and IBM SPSS Amos 26 programmes were used for statistical analyses. Whether the scores obtained from each variable were normally distributed was analysed by descriptive, graphical and statistical methods. The Kolmogorov-Smirnov test was carried out to determine the normality of statistically generated scores from a continuous variable. Cronbach's α reliability coefficients were used to measure the reliability of the scales and ICC was used to determine the test-retest agreement. In addition to descriptive statistical methods, the level of relationship between two continuous variables was analysed by Pearson correlation test. Explanatory and confirmatory factor analyses and goodness of fit indices were used for validity analyses. The results were evaluated within 95% confidence interval and significance was evaluated $p<0.05$.

Ethical Considerations

The study was conducted according to the guidelines of the Declaration of Helsinki and approved by the Ethical Committee (2022-20/12). All patients were informed about the research purpose and procedure, and written consent was obtained from those who agreed to participate in the study.

RESULTS AND DISCUSSION

The study included 217 breast cancer survivor women with a mean age of 48.8±8.8 years. The mean age at diagnosis was 45.1±8.8 years, 69% were married, 78% were university graduates and 51% were actively working (see Table 1).

Table 1. Demographic Characteristics of Women Breast Cancer Survivors

Variables (N=217)	N	%
Age, mean (±SD)	48.8 (±8.8)	
Age of diagnosis, mean (±SD)	45.1 (±8.8)	
Marital status		
Single	68	31.3
Married	149	68.7
Educational level		
High school	48	22.1
University	169	77.9
Working status		
Working	111	51.2
Not working	106	48.8

%: Percentage

Reliability Analyses

Internal Consistency

The reliability coefficient for the total score of BCSES was calculated as Cronbach's α=0.852, the first factor sub-dimension was Cronbach's α =0.823 and the second factor sub-dimension was Cronbach's α=0.776. The general acceptance for the calculated coefficient is at >0,70.[18] It was determined that the reliability level of the BCSES was high. Cronbach's α value was 0.89 in the original English scale.[8] In the Chinese scale, the Cronbach's α of the two factors (0.79- 0.88) and the total scale were found to be 0,82.[19]

The item-total score correlation of 11 items in the scale was analysed. Item total score correlation were calculated to be between r=0.50 and r=0.61 (see Table 2). The correlation between the items was found to be positive and adequate, values endorsed by Nunnally and Bernstein.[20] In the original form of the scale, 14 items were initially identified; however, 3 items were removed as a result of additional analyses using inter-item correlations. The other items of the scale ranged from 0.50-0.73, while in the Chinese version, item-total correlations ranged from 0.61-0.76.[8,19]

Validity Analyses

Content validity

By computing the Content Validity Index (CVI), the qualitative data gathered in accordance with expert judgments were turned into quantitative data. CVI was calculated as 0,969 for all items. Davis (1992) has recommended a minimum CVI of 0,80. This scale CVI value was higher than the accepted criterion of 0,80 and statistically significant. The scale has an understandable structure and content.[21,22]

Construct Validity

Exploratory Factor Analysis (EFA)

Fit statistics measure how well the proposed model matches reality, proving the model's construct validity. There are several fit statistics, each with its own set of advantages and disadvantages.[23] Varimax rotation was used to the scale scores and principal component factor analysis was done to identify the factor structure of the scale. Kaiser-Meyer-Olkin (KMO) for adequate sampling and "Barlett test values for sample size were calculated. KMO value was calculated as 0.843 in principal components factor analysis. This value support the appropriateness of continuing the factor analysis.[24] In CFA, the fit of the model is decided not according to a single test but according to various fit indices. These fit indices are named as $\chi 2$, $\chi 2$ /sd, GFI, AGFI, RMSEA, RMR, SRMR.[25,26] The fit indices of BCSES scale were investigated.

The sample size analysis Bartlett's Test of Sphericity Test=822.967 and was highly significant ($p<0.001$). The factor analysis revealed two factors under 11 items with eigenvalues larger than one. The first component accounted for 41.28% of the scale variation, while the second factor accounted for 11.62% of the scale variance; combined variables accounted for 52.9% of the overall variance. Two variables with eigenvalues larger than 1.0 and a total explained variance of 57.04% were discovered. The first component explained 93% of the variation shared among the 11 variables and 44% of the overall variance of the 11 variables on an original scale.[19]

Table 2. Breast Cancer Survivorship Self-Efficacy Scale Factor and Item Analysis Results

Sub-scale	Items	ITSC*	Factor Loading	Cronbach's α	Explained Variance (%)
Self-care and coping	Item 2	0.56	0.50	0.823	41.28
	Item 3	0.59	0.53		
	Item 5	0.51	0.72		
	Item 6	0.58	0.53		
	Item 7	0.50	0.67		
	Item8	0.61	0.68		
	Item 9	0.54	0.75		
	Item 10	0.52	0.48		
Self-help seeking	Item 1	0.50	0.82	0.776	11.62
	Item 4	0.56	0.82		
	Item 11	0.53	0.76		
BCSES-Total		-	-	**0.852**	**52.90**
Kaiser-Meyer-Olkin (KMO) Measure of Sampling Adequacy					0.843
Barlett's Sphericity Test Chi-Square Value *(X^2)*					822.967
Degrees of Freedom *(df)*					55
Significance Level *(Sig.)*					<0.001

**ITSC: Item Total Score Correlation, BCSES: Breast Cancer Survivorship Self-Efficacy Scale*

The factor loads of the items of the scale ranged between 0,48-0,82. In the 11-item scale, eight items (2, 3, 5, 6, 7, 8, 9 and 10) were grouped under first factor and three items (1, 4 and 11) under second factor. When the items collected under the factors were analysed in detail; it was determined that the items collected under the first factor were related to "Self-care and coping" and the second factor was related to "Self-help seeking." (see Table 2). In the evaluation of the Turkish scale, it is recommended that it be evaluated on the total score by remaining faithful to the original form.

Confirmatory Factor Analysis (CFA)

CFA was applied to measure the construct validity of the scale. Figure 1 shows the CFA standardized path coefficients, factor loadings and error values. Standardized factor loading values were >0.30 and standardized error values were <0.90. It was determined that the items in this model represented the relevant construct very well. In the Chinese scale, all the factor loads of the items were in excess of 0.40.[19] It is stated that nurse academics generally use CFA to confirm their findings after EFA.[26]

Measurement Model Fit Statistics (χ2/df, RMSEA, SRMR, NFI, NNFI(TLI), CFI, GFI and RFI) were analyzed. RMSEA and SRMR values of the model were calculated as 0.075 and 0.053. The chi-square value was statistically significant (χ2=86.978; n=217, df=39, p<0.001). In the model, χ2/df

(86.978/39)=2.23 and this value was <3, indicating that the model was within acceptable fit limits. It is seen that the other fit index values in the table meet the good fit criteria (Table 3). According to these results,

it was determined that the structure obtained with EFA was confirmed with CFA.[27,28]

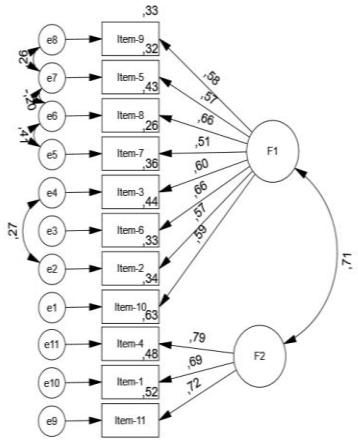

Figure 1. Breast Cancer Survivorship Self-Efficacy Scale Confirmatory Factor Analysis (CFA) Model and Factor Loadings

Convergent validity

Convergent validity examines the high agreement between the trait measured by the scale and another similar scale that is thought to be related.[18] In this study, GSES was used as a similar scale. The GSES was applied to test the equivalent scale validity of the BCSES scale.

The internal consistency level of the GSES was calculated as α=0.93. A statistically significant and positive correlation was found between the BCSES and the GSES scores (r=0.525; p<0.001) (Table 4). It was determined that as women's general self-efficacy levels increased, their survivor self-efficacy levels also increased.

Table 3. Breast Cancer Survivorship Self-Efficacy Scale Confirmatory Factor Analysis (CFA) Fit Index Values

	Index of Fit Criteria Values		BCSES
	Normal Values	Acceptable Values	CFA Index
$\chi 2$/df	$0 \leq \chi 2$ /df ≤ 2	$2 \leq \chi 2$/df ≤ 3	2.23
RMSEA	0<RMSEA<0.05	0.05<RMSEA<0.08	0.075
SRMR	0<SRMR<0.05	0.05<SRMR<0.10	0.053
NFI	0.95<NFI<1.00	0.90<NFI<0.95	0.90
NNFI(TLI)	0.97<NNFI<1.00	0.95<NNFI<0.97	0.91
CFI	0.97<CFI<1.00	0.95<CFI<0.97	0.94
GFI	0.95<GFI<1.00	0.90<GFI<0.95	0.94
RFI	0.90<RFI<1.00	0.85<RFI<0.90	0.85

Root Mean Square Error of Approximation (RMSEA), Standardized Root Mean Square Residual (SRMR), Normed Fit Index (NFI), Non-Normed Fit Index (NNFI), Comparative Fit Index (CFI), Goodness of Fit Index (GFI), Relative Fit Index (RFI)

Table 4. Breast Cancer Survivorship Self-Efficacy Scale Means, Standard Deviations, Range and Correlations and Test-Retest Reliability

No.	Variable	Mean (SD)	Range	1	2	3
1	First Factor	33.39(3.90)	19-40	NA		
2	Second Factor	14.03(1.31)	9-15	0.549*		
3	BCSES-Total	47.42(4.75)	30-55	0.973*	0.727*	
4	GSES-Total	31.98(5.94)	13-40	0.504*	0.403*	0.525*
BCSES (N=55)		**Test**	**Re-Test**			
$\bar{X}\pm SD$		47.85±4.58	47.07±5.05			
ICC		r=0.933*				
Cronbach's α		α=0.939				

p<0.001, Pearson correlation test, SD=Standard deviation, NA: Not available, GSES: General Self-Efficacy Scale, BCSES: Breast Cancer Survivorship Self-Efficacy Scale, *p<0.001;* ***ICC:* *Intraclass correlation coefficient*

Test-retest reliability

In the test-retest reliability, it is stated that it will be sufficient to re-test 25% to 50% of the people who participated in the research.[29] The 55 women in the sample (25%) were reached again after three weeks and the scale was filled out again and ICC was analysed for test-retest reliability. The pre-test and post-test item total scores had a statistically significant extremely high positive association (ICC=0.933; p<0.001) (Table 4). The ICC value of the BCSES shows that the consistency of the scale in the temporal process is at a very good level.[30] The ICC analysis in Chinese BCSES exhibited satisfactory test-retest reliability within the acceptable range (0.30-0.70).[19]

CONCLUSION AND RECOMMENDATIONS

The Breast Cancer Self-Efficacy Survivor Scale was demonstrated to be a relevant and dependable instrument in Turkish culture. In conclusion, BCSES consists of 11 items in total and there are no reverse items in the scale. The scale score range is 11-55 and there is no cut-off score. High scores indicate high self-efficacy in breast cancer survivors. The original scale consists of a single dimension. In the Turkish validity and reliability study of the scale, a two-factor structure was determined (Selfcare and

coping – Selfhelp seeking). However, as in the original scale, it is recommended to evaluate the total score. It is thought that this scale may be a good indicator for nurses to provide effective survivor care. The scale may be useful for identifying survivor women with low self-efficacy and supporting them with nursing interventions. The data of the study belong to a single centre in a private health institution. Therefore, it is recommended to adapt the scale to women receiving survivorship care in different health institutions.

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