Original Article

Psychometric Properties of the Iranian version of Champion's Revised Health Belief Model Scale for Breast Cancer screening

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Abstract

Background: Women's beliefs regarding breast cancer and its screening approaches were considered antecedents of their behavioral changes. Understanding of these beliefs in women requires a valid and reliable instrument. The present study seeks to translate the English version of the Champion's Revised Health Belief Model Scale (CRHBMS) into the Persian language and assess its psychometric properties. **Materials and Methods:** The study was conducted on 334 students at Urmia University of Medical Sciences, Iran, 2016. The 57-item CRHBMS was translated to Persian language, back translated, and tested. To test the face and content validity of the Persian version; item analysis, Content Validity Ratio (CVR), and Content Validity Index (CVI) were applied, respectively. Construct validity of the Persian scale was performed by Exploratory and Confirmatory Factor Analyses (EFA, CFA) using Kaiser-Meyer-Olkin and Bartlett's tests in SPSS 16 and LISREL8.72 software. The reliability of the translated scale was evaluated using Cronbach's alpha and test-retest approaches. **Results:** In the EFA, eight factors were extracted concerning breast cancer screening, and each item was loaded on its specific factor. These factors were self-efficacy, health motivation, benefits-mammography, benefits-Breast Self-Examination (BSE), barriers-mammography, barriers-BSE, susceptibility, and severity. The final 42-item scale was confirmed by the CFA, and all goodness of fit indices showed a proper fit of the model. Cronbach's alpha coefficient and test-retest correlation of the subscales ranged from 0.72–0.89 and 0.67–0.93, respectively. **Conclusions:** The study suggests that the Persian version of CRHBMS is a feasible scale for evaluating women's health beliefs regarding breast cancer and its screening behaviors.

Keywords: *Breast cancer screening, champion health belief model, Iran, Persian, psychometrics*

Introduction

Breast Cancer (BC) is a global health-threatening condition, comprising one-third of all cancers among women worldwide. Breast cancer is the second most common cancer following lung cancer and the most prevalent cause of cancer-related death among women.[1] More than 502,000 Iranian women die of cancer every year.[2] With the increase in life expectancy and population aging in Iran, the incidence of cancer is expected to augment in the coming years.[1,3]

Currently, breast cancer incidence in Iran is estimated at 22.09% per 100,000 women, while its standardized incidence rate with age is estimated at 25.28% per 100,000 women.[4] The age of incidence in Iranian women is at least 10 years earlier than western women.[5] A study conducted by Montazeri *et al*. (2003) revealed that 23% of the breast cancer cases observed in Iran were younger than 40 years, 70% of whom died due to the advancement of the disease.[6]

Probably, the causes of the high incidence of BC in Iranian women are yet unknown. Evidence shows that factors such as diet, alcohol consumption, hormonal role, and earlier age at menarche, are linked with increased risk of breast cancer.[7,8] The study performed by Mahouri *et al*. (2007) revealed that Iranian single women with menarche at a younger age, family history of BC, first pregnancy at an age above 30 years, and more than five pregnancies ran a higher risk of the disease. In addition, women's knowledge regarding BC and its preventive and protective ways, and their beliefs towards health behaviors play a crucial role in preventing cancer.[9]

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Early diagnosis of BC can accelerate the process of cancer treatment, significantly reduce mortality, and improve the overall life quality in women.[10] Many studies have shown that BC screening tests such as Breast Self-Examination (BSE), mammogram, and Clinical Breast Examinations (CBE) play an important role in early diagnosis.[5,10] Despite the considerable efficacy of screening tests in the early detection of breast cancer, researches have shown that such recommended screening methods are still few and far between in Iranian women, which contributes to the incidence of breast cancer and its associated deaths.[5,11] In the Iranian context, the most important causes reported, for not following cancer-screening behaviors, were lack of knowledge and beliefs towards such behaviors.[5] Health behavior changes theories/models help researchers find factors related to health behaviors.[12]

The Health Belief Model (HBM) is a psychosocial conceptual framework commonly used to determine people's beliefs concerning health-promoting behaviors. In some previous studies, the efficacy of HBM in identifying women's beliefs regarding breast cancer screening behaviors has been proved and confirmed.[13,14] HBM was originally developed as an approach to determine why people do not perform screening programs recommended by healthcare providers. According to Hochbaum (1958), the main concept of HBM is that health behaviors are specified by personal beliefs regarding disease and its preventive methods. The following beliefs act as the main elements of the HBM model: perceived sensitivity, perceived severity, perceived benefits, perceived barriers, perceived self-efficacy, and health motivation. These constructs can be used individually or together to explain given health behavior.[15] To evaluate people's beliefs towards breast cancer, Champion's Revised Health Belief Model Scale (CRHBMS) was proposed by Champion.[16] This scale was modified three times[17-19] and has been translated and tested in different countries with different cultures.[20-22] In Iran, Taymoori in Sanandaj (2009)[5] and Hashemian[23] in Sabzevar (2013) investigated the validity and reliability of this questionnaire. However, they did not employ exploratory and confirmatory factor analysis simultaneously in assessing the construct validity of the questionnaire. This research lacuna led to the design of the present study. Determining and understanding students' beliefs and attitudes concerning breast cancer screening behaviors provide useful information to plan and deliver suitable health education programs for early detection. Due to the scarcity of valid and reliable Iranian scales for measuring students' beliefs towards breast cancer screening, the present authors decided to conduct a study aimed at assessing the validity and reliability of the Persian version of CRHBMS for breast cancer screening among Iranian university students.

Materials and Methods

The present research is a cross-sectional study performed on a sample of female students from October to March 2016, in Urmia University of Medical Sciences, Urmia, northwest of Iran. Using the stratified random sampling method, 366 eligible female students were selected from among different schools of the university. Each school was considered as one class, the sample proportion of the total female students in each class (school) was determined, and the samples were randomly selected from different classes.

Inclusion criteria were female undergraduate, graduate, medical, dentistry, and pharmaceutics students studying in the Urmia University of Medical Sciences, aged between 20 to 30 years, and who had the willingness to participate in the study. After deleting the cases with incomplete or missing data (n = 32), a sample of 334 participants remained. In the present study, the sample size was determined based on the variables (questionnaire items). According to Anderson *et al*.,[24] the sample size should be 100 or more, and Comrey[25] has suggested that a sample of 300 is a good sample for psychometric studies. Based on the foregoing researchers' viewpoints, the sample size of the current study is suitable for EFA and CFA analyses.

To collect the study data, the following questionnaires were utilized; (1) participants' sociodemographic questionnaire for assessing variables such as academic year, the average score of academic grade, age, ethnicity, and family history of breast cancer, (2) CRHBMS, which was firstly developed by Champion in 1993,[17] and revised and updated in 1997[18] and 1999.[19] Finally, the latest version of CRHBMS was applied to measure the subjects' perceptions of breast cancer and its screening. CRHBMS is a self-reporting instrument that consists of 57 items with eight subscales: (a) perceived susceptibility to breast cancer (5 items), (b) perceived severity (7 items), (c) benefits-BSE (6 items), (d) barriers-BSE (6 items), (e) perceived self-efficacy (11 items), (f) health motivation (7 items), (g) benefits-mammography (5 items), and (h) barriers-mammography (11 items). All subscale items were based on the 5-point Likert scale, ranging from 1 "strongly disagree" to 5 "strongly agree".[19]

The CRHBMS instrument was translated from English to Persian using a standard forward-backward translation technique.[26] The original instrument was translated by a bilingual specialist. Two independent bilingual professionals, to assess the retention of the original meaning in the source language then retranslated the Persian version into English. Subsequently, translators worked separately and prepared the final version of the Persian translation. Quantitative and qualitative methods were employed to assess face validity. In the qualitative method, the questionnaire was given to a 10-person panel in the fields of health education and health promotion, nursing, gynecology, and psychology to assess the difficulty level, inappropriateness level, and ambiguity of phrases or words. The required revisions were then performed in the questionnaire according to the suggestions of the expert panel. In the quantitative method, the impact

score of each item was examined. For each of the 57 items of the tool, the 5-point Likert scale was considered, ranging from 1 (not important at all) to 5 (highly important).[27] The questionnaire was then administered to 25 eligible students to determine its validity. Next, all questionnaires were collected and analyzed, the impact score was computed for each item and scores >1.5 were considered acceptable.

Impact score = Frequency (%) × Importance,[20]

A panel of Iranian experts including three gynecologists, three health education professors, two psychologists, and two reproductive health professors examined the final Persian version to determine the cultural appropriateness and content validity of the translated questionnaire. For this purpose, the researchers applied Quantitative Content Validity (QCV), which was determined by Content Validity Ratio (CVR) and Content Validity Index (CVI). To calculate the CVR, the expert panel scored each item using a 3-point Likert questionnaire, including "3: essential", "2: useful but not essential", and "1: unessential". After that, the items with a CVR of 0.62 or more were selected according to Lawshe's table.[28] CVI is another method for evaluating the content validity of the research questionnaire. In this approach, the panel was asked to evaluate each item in terms of relevance and clarity and give each item 1 to 4 points based on the following 4-point scale: 1 = non-related, 2 = somewhat related, 3 = quite relevant, 4 = highly relevant, or 1 = not clear, 2 = requires some revision, 3 = clear, but requires minor revision, 4 = very clear.[29] A CVI score equal to 0.8 or higher indicates the appropriateness of content validity.[30]

To analyze the descriptive data, descriptive statistical methods were applied in SPSS version 16 software (SPSS Inc., Chicago, IL, USA). The construct validity of the Champion's questionnaire was evaluated by EFA and CFA using SPSS 16 and LISREL8.72 software. In the EFA, Kaiser- Meyer-Olkin (KMO) and Bartlett's test of sphericity were applied to assess the sampling adequacy and increase the correlation coefficients of the scores between the items of the questionnaire. Decisions regarding the number of extractable factors in exploratory factor analysis were made using eigenvalues, factor loadings, and screen plot diagrams. In this study, the researcher used varimax orthogonal rotation method to obtain the independent factors. In EFA, the factor load of each item in the rotated matrix should be at least 0.4, each factor should contain a minimum of three items, and the item eigenvalues are to be higher than 1.5. In CFA, the factor loadings of each item were considered to be at least 0.3.[31,32] The decision about the Goodness of Fit (GOF) of the model was made using fit indicators. A model is considered as an acceptable fit when the value of indicators such as Comparative Fit Index (CFI), Normed Fit Index (NFI), Incremental Fit Index (IFI), Relative Fit Index (RFI), Goodness of Fit Index (GFI), and Adjusted Goodness of Fit Index (AGFI) is more than 0.90, Root Mean Square Error of Approximation (RMSEA) is lower than 0.08, and Chi-square ratio to the degrees of freedom is lower than 2.[33,34]

To determine the reliability, Cronbach's alpha and test-retest methods were used. With confidence, lower values showed that the tool was not homogeneous and reliable ($0.00 \leq \alpha < 0.40$ unreliable, $0.40 \leq \alpha < 0.60$ low reliability, $0.60 \leq \alpha < 0.80$, high reliability, $0.80 \leq \alpha < 1$ very high reliability).[35,36] Test-retest reliability refers to the correlation coefficient which should be at least 0.6.[35]

In this type of reliability method, a group of 25 students similar to the main study group completed the questionnaire. Once again, the same group of students completed the same questionnaire after 2 weeks, and the results of the correlation coefficient test were compared.

Ethical considerations

This article was extracted from the research proposal with No. 2185 approved by the Ethics Committee of Urmia University of Medical Sciences. Students were informed about the proposal's objectives and were assured that the results of the study would be confidential. In addition, verbal informed consent was obtained from all participants in the study.

Results

This survey was performed on 366 students studying in different academic fields in the Urmia University of Medical Sciences. Of these, 32 subjects were excluded from the study as they partially completed the questionnaires (the response rate was 91.25%). Ultimately, statistical analyses were conducted on 334 participants whose mean (SD) age was 21.92 (1.69 years). Approximately, 70% of the subjects were undergraduate/graduate students and 36% were juniors. More than 60% of the participants were Turks, and the academic grade of slightly more than 40% of the students was at a moderate level. About 9.6% of the participants reported cancer in their family and relatives. Table 1 presents further information about the demographic characteristics of the participants.

Regarding face validity, students were asked to rate the items based on a 5-point Likert scale ranging from 1 (not important at all) to 5 (highly important). In item analysis, the impact score for items SE5 and SE6 was lower than 1.5. The subjects reported that more than two items were not simple, understandable or clear. In addition, concerning content validity, the results of QCV showed that CVR and CVI values of items SE5 and SE6 were not in the acceptable range, hence deleted from the perceived self-efficacy subscale.

According to the results, KMO was 0.83 and the significance level of Bartlett's test of sphericity was less than 0.001. Based on both the above criteria, it can be concluded that the implementation of EFA is justifiable based on the correlation matrix in the sample group.

Results of EFA showed that the factor loading of 13 items (HM5, HM6, HM7, SUS1, SEV4, SEV7 BEN1-S, BEN2-S, BAR1-M, BAR2-M, BAR4-M, BAR5-M, and BAR6-M) was less than 0.40, hence deleted from the questionnaire. Following the removal of these questions, the final EFA was once again performed on the 42 remaining items by main component analysis using orthogonal rotation (varimax rotation). In this analysis, the main eight factors with eigenvalue >1.5 were selected. The screen plot diagram further confirmed the selection of the eight factors because the eigenvalues of other factors (from factor 9 onwards) were relatively close to one another. The main statistical characteristics in the implementation of EFA are separately shown and extracted for each factor in Table 2.

The final model included the following 42 items and 8 factors: 1. Self-efficacy (9 items), 2. Health motivation (4 items), 3. Benefits of mammography (5 items), 4. Benefits of BSE (4 items), 5. Barriers of mammography (6 items), 6. Barriers to BSE (5 items), 7. Susceptibility (4 items), and 8. Severity (5 items).

A CFA was employed to investigate the suitability of the structure related to the eight specified factors in EFA. For this purpose, after designing the model in Liserl software and performing the analysis by structural equation modeling, the GOF indices of this model [Figure 1] were calculated, evaluated, and summarized in Table 3.

The results of Table 3 reported all indices to be highly desirable, and the model with data had relative compatibility, meaning the items were consistent with the theoretical construct. According to LISREL output, the calculated Chi-square was 1552.32, which shows a slight difference between the conceptual model and the observed data of the research. In addition, the RSMEA value was 0.054, indicating a better GOF. As observed, this amount was within the permissible limit, which indicates a better GOF.

The comparative GOF indices of CFI, NFI, RFI, and IFI show the excellent compatibility of the model. In addition, the absolute GOF indices of the GFI (0.92) and AGFI (0.90) were in the standard limit, confirming the model. In general, GOF indices of the model showed an excellent compatibility status [Table 3].

Table 1: Demographic characteristics of the study sample (*n*=334)

Variable	N (%)
Academic level:	
General practitioner/Pharmacy/Dentistry	97 (29)
Undergraduate/Graduate	237 (71)
Academic year:	
First	84 (25.10)
Second	83 (24.90)
Third	121 (36.20)
Fourth and higher	46 (13.80)
Ethnicity:	
Turk	209 (60.20)
Kurd	101 (32.60)
Others	24 (7.20)
Academic grade:	
Low (<14)	21 (6.30)
Moderate (14-15.99)	134 (40.10)
Good (16-17)	129 (38.60)
Excellent (>17)	50 (15.00)
History of Breast Cancer:	
Yes	32 (9.60)
No	302 (90.40)

Table 2: Items related to 8 factors and extraction values after Varimax rotation of breast cancer screening questionnaire

Factor	Number of items	Items	Range of load factor (min, max)	Rotation Sums of Squared Loadings		
				Eigenvalue	Percent of variance	Cumulative %
Self-efficacy	9	SE1, SE2, SE3, SE4, SE7, SE8, SE9, SE10, SE11	0.59-0.78	5.03	11.98	11.98
Health motivation	4	HM1, HM2, HM3, HM4	0.71-0.86	3.45	8.21	20.20
Benefits of mammography	5	BEN1-M, BEN2-M, BEN3-M, BEN4-M, BEN5-M	0.62-0.68	3.00	7.16	27.36
Benefits of BSE	4	BEN3-BSE, BEN4-BSE, BEN5-BSE, BEN6-BSE	0.71-0.82	2.98	7.11	34.47
Barriers of mammography	6	BAR3-M, BAR7-M, BAR8-M, BAR9-M, BAR10-M, BAR11-M	0.53-0.73	2.89	6.90	41.37
Barriers to BSE	5	BAR1-BSE, BAR2-BSE, BAR3-BSE, BAR4-BSE, BAR5-BSE	0.64-0.81	2.87	6.83	48.21
Susceptibility	4	SUS2, SUS3, SUS4, SUS5	0.62-0.81	2.52	6.00	54.21
Severity	5	SEV1, SEV2, SEV3, SEV5, SEV6	061-0.77	2.46	5.86	60.08

SE: Self-Efficacy, HM: Health Motivation, BEN-M: Benefits of Mammography, BEN-BSE: Benefits of Breast Self-Examination, BAR-M: Barriers of Mammography, BAR-BSE: Barriers of Breast Self-Examination, SUS: Susceptibility, SEV: Severity, Min: Minimum, Max: Maximum

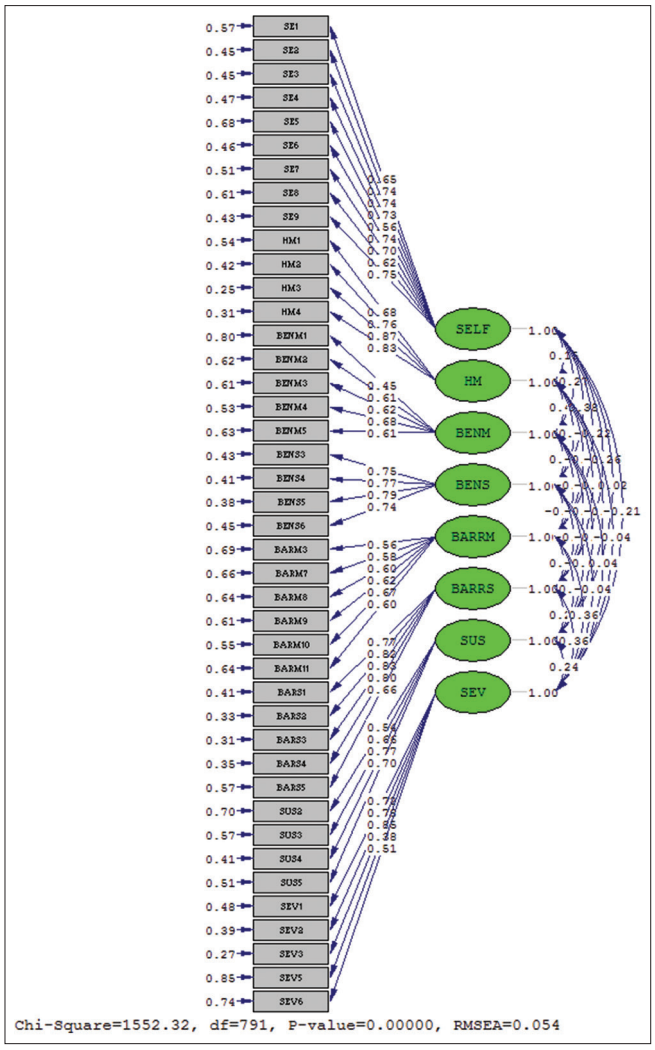

Figure 1: Path diagram for confirmatory factor analysis of the breast cancer screening questionnaire. SELF: Self-efficacy; HM: Health motivation; BENM: Benefits of mammography; BENS: Benefits of breast self-examination; BARRM: Barriers of mammography; BARRS: Barriers of breast self-examination; SUS: Susceptibility; SEV: Severity

Table 4 shows that the Cronbach's alpha coefficient was maintained for the eight subscales of the final version of the questionnaire. The Cronbach's alpha value for the CRHBMS Persian subscales ranged from 0.72 to 0.89. The item-total correlation coefficient was between 0.30 and 0.74, meaning that the items were sufficiently relevant. The test-retest results of this study are shown in Table 5.

The total test and retest reliability for all items had a Spearman correlation of 0.92, $p < 0.001$. Spearman correlation of the subscales of the Iranian CRHBMS ranged from 0.67 to 0.93. The results of test-retest reliability demonstrated acceptable stability for all measures over a 2-week period.

Discussion

In this study, researchers evaluated the validity and reliability of a translated Persian version of CRHBMS for screening breast cancer in Iranian students. The final instrument consisted of 8 subscales with 42 items. The results revealed that this instrument is suitable for a sample of Iranian subjects to evaluate their beliefs regarding breast cancer screening methods.

Consistent with the findings of the present study, Taymoori *et al*. (2009) observed that the items related to the beliefs of Iranian women regarding breast cancer and its screening methods were loaded on eight factors which

Table 3: Indices of the goodness of fit

Index	Acronyms	Acceptable value	Observed value
Root mean square error of approximation	RMSEA	<0.08	0.05
Chi-degree freedom	CMIN/DF	<3	1.96
Incremental fit index	IFI	≥0.90	0.94
Relative fit index	RFI	≥0.90	0.93
Normed Fit Index	NFI	≥0.90	0.91
The goodness of fit Index	GFI	≥0.90	0.92
Adjusted Goodness of Fit	AGFI	≥0.90	0.90
Comparative Fit Index	CFI	≥0.90	0.94

Table 4: Item-Total Correlation and Cronbach α for Subscales

Subscale	No. items	(Min*-Max)** item-total subscale correlation	Cronbach α
Self-efficacy	9	(0.41-0.56)	0.89
Health motivation	4	(0.51-0.74)	0.85
Benefits of mammography	5	(0.30-0.45)	0.72
Benefits of Breast Self-Examination (BSE)	4	(0.48-0.62)	0.84
Barriers of mammography	6	(0.31-0.46)	0.77
Barriers to BSE	5	(0.47-0.72)	0.88
Susceptibility	4	(0.34-0.55)	0.75
Severity	5	(0.32-0.59)	0.79

*Min: Minimum, **Max: Maximum

Table 5: Test-retest correlations of the major theoretical variables (*n*=25)

Variables	Mean (SD)		Spearman's rho
	Test	Retest	
Self-efficacy	22.24 (6.80)	21.80 (7.08)	0.82
Health motivation	17.28 (3.69)	17.08 (3.53)	0.68
Benefits of mammography	18.04 (3.88)	17.28 (4.30)	0.67
Benefits of Breast Self-Examination (BSE)	17.28 (4.30)	15.12 (4.07)	0.93
Barriers of mammography	14.96 (4.46)	16.20 (4.31)	0.85
Barriers to BSE	9.28 (3.78)	10.00 (3.81)	0.87
Susceptibility	9.52 (3.40)	9.68 (2.67)	0.89
Severity	15.32 (5.43)	13.76 (4.19)	0.75
The total item	122.24 (17.83)	120.20 (17.49)	0.92

were[5] contrary to our results wherein the HBM questions concerning breast cancer screening behavior focused on only six factors.[20,37] These differences may be attributed to the differences in populations and ethnic and sociocultural discrepancies. The existing differences between the results were mainly explained by the generation gap in the studied groups among women and other groups. Other reasons may stem from the active cognitive processes of students compared to other female groups.

In the face and content validity stages; the scores of item impact, CVR, and CVI were related to the two items from Self-Efficacy subscale (SE5, SE6): "I am able to find a breast lump which is the size of a quarter'' and ''I am able to find a breast lump which is the size of a dime,'' were lower than the acceptable limits, hence removed from the subscale. This is because the students and the expert panel gave low scores to the foregoing items, arguing that there are no Iranian coins similar to quarters and dimes. The remaining items obtained an acceptable score regarding face and content validity. To determine the construct validity, EFA was conducted on the remaining items of the study instrument (55 items).

Based on the EFA results, all questions were clustered in self-efficacy, barriers-BSE, and benefits of mammography subscales. The results of the Champion's study were consistent with our findings.[17] All subscale questions had an appropriate and acceptable load factor, separately loaded on the related factor. For instance, all questions of the self-efficacy scale were loaded on one factor. Unlike the findings of the studies conducted in Jordan and Malaysia, Korean and American studies[38,39] corroborated this part of our results.[20,40]

Contrary to some previous findings,[38,40] all items related to the health motivation subscale were loaded on one factor. According to the results of EFA, three items of health motivation subscale, namely, "eating well-balanced meals (HM5)," "exercising at least three times a week (HM6)," and "regular health checkups (HM7)," were unsatisfactory among Iranian female students, which is in line with the results of a Turkish study.[41] Iranian women are less likely to receive healthcare, hence the fact that regular health surveys are low in the general population. The health beliefs of Iranian female students regarding health motivation were similar to the beliefs of Jordanian,[39] Turkish,[42] and Malaysian women.[20]

The results of EFA further revealed that participants did not find out any important items of susceptibility (SUS1), severity (SEV4, SEV7), and benefits (BEN1-S, BEN2-S). It seems that students, as future women, think that they are young and invincible. On the other hand, it may have been because of the cultural differences and little knowledge regarding breast cancer and its screening methods.

According to the previous literature, Muslim women believe in God's hand in illness.[40,43] Champion and Menon's study (1997) showed that an optimistic perspective prevented women from understanding the benefits of early detection methods.[44] This view has made Muslim women, Iranian women in particular, less sensitive to breast cancer compared with non-Muslim women. The findings of the study conducted by Parsa *et al*. (2008) and Secginli *et al*. (2004) are in line with the present results.[20,42] In addition, the results indicated that the students did not understand certain items (BAR1-M, BAR2-M, BAR4-M, BAR5-M, and BAR6-M) as barriers, which might be attributed to the subjects' sociodemographic characteristics, knowledge, and experience with regards to mammography. The study of Yilmaz *et al*., (2013) corroborate the present research.[45]

The CFA was then applied to test the remaining 42-item eight-factor model. The structure of item loadings was consistent with the intended theoretical constructs, meaning all item loadings were more than 0.3 and retained in the model. The CFA results showed that the Chi-square ratio to the degree of freedom and RMSEA value was 1.96 and 0.054 (with a confidence interval of 0.050 and 0.066), respectively. In addition, the values of CFI, IFI, RFI, GFI, AGFI, and NFI were more than 0.90. Therefore, CFA shows the adequacy of the model and the suitability of its structure.

The results revealed that the Persian version of CRHBMS had high reliability because Cronbach's alpha coefficient for the subscales of HBM ranged from 0.72 to 0.88, which means that the present scale was reliable and suitable for evaluating women's beliefs towards breast cancer and its screening methods.

In accordance with the present research, Wu *et al*. (2003) reported that Cronbach's alpha coefficients for Champion's subscales varied from 0.77 to 0.90 among Chinese-American women.[45] In addition, the results of Parsa *et al*. (2008)[20] in Malaysian women, Champion *et al*. (2008),[46] and Medina-Shepherd and Kleier's study in 2010,[47] also corroborate the findings of the present study.

In our study, test-retest reliability correlations ranged from 0.67 to 0.93 regarding the Iranian version of CHRBMS. In Hashemian and colleagues' study (2013),[23] test-retest reliability correlation varied from 0.67 to 0.92 concerning the Persian scale version among Iranian women. Most Iranian CRHBMS subscales in our study showed similar psychometric properties to the more recent findings.[45,47] However, according to the test-retest results, participants answered the scale items similarly in both sessions, indicating that the scale has strong stability over time. In total, the scale of CRHBMS was evaluated among a sample of female university students in Iran. Following examinations, this instrument can obtain the necessary reliability among Iranian samples and can be used to measure women's health beliefs pertaining to breast cancer and its screening methods.

As far as the limitations are concerned, the study data were collected using a self-reported questionnaire. Participants may have underestimated or overestimated their health beliefs, which might have affected the study findings. Secondly, the study population was limited to only one region in Iran. Therefore, it is recommended that similar studies should be conducted in other regions to increase the study validity.

Conclusion

This study supports the use of the Persian version of CRHBMS to examine Iranian female students' beliefs regarding breast cancer and screening. Different researchers such as nurses, midwives, and other health scientists can make use of these results to develop and implement effective educational and behavioral interventions. By identifying women's beliefs and behaviors towards screening for breast cancer, facilitators and barriers can be better fathomed. To understand such beliefs, a valid and reliable tool is essential. More psychometric testing of this scale is recommended for a population of women with different social, economic, and geographical status. Finally, future studies are to focus on analyzing the existing scale factors in larger sample sizes.

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Conflict of interest

Nothing to declare.

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