



Original Article

Translation and Psychometric Testing Persian Version of Breast Cancer Screening Belief Questionnaire (BCSBQ) in Iranian Women

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ABSTRACT

Introduction: Women's screening beliefs play an important role in their performance. Since a short form questionnaire is necessary in the assessment of screening beliefs in Iranian society, this study was conducted with the aim of psychometric evaluation of the Breast Cancer Screening Beliefs Questionnaire (BCSBQ) among Iranian women.

Methods: In this cross-sectional methodological study, 300 Iranian women who were aged 18 years or older, and who were attending healthcare centers of Shahid Beheshti University of Medical Sciences, were selected in 2017-18. After a backward-forward translation procedure of BCSBQ was carried out, the face, content and construct validity of breast cancer-screening beliefs questionnaire were evaluated. In addition, the reliability was measured using the Cronbach's alpha and intra class correlation coefficients.

Results: The results of the exploratory and confirmatory factor analysis were used to extract three distinct factors, including: attitude, knowledge, and barriers to screening. The three-factor model fit was accepted for all factors based on standard indices (RMSEA = 0.12, $\chi^2 = 2.832$, GFI = 0.87, AGFI = 0.8, CFI = 0.94, NFI = 0.92). In addition, the instrument's reliability was measured using the Cronbach's alpha coefficient. The instrument had an appropriate Cronbach alpha (0.78). The interclass correlation coefficient was obtained to be 0.93 within a range of 0.83-0.97.

Conclusion: The three-factor structure of the BCSBQ-12 had appropriate validity and reliability among Iranian women. Considering its appropriate psychometric properties, this instrument can be employed in subsequent studies to measure women's breast cancer screening beliefs in Iran.

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Introduction

About one fourth of all cancers in women worldwide are breast cancer (BC).¹ GLOBOCAN reported, an estimated 1.7 million cases of BC were found in 2012.² There are three methods for screening of breast cancer including: breast self-examination, clinical breast examination and mammography.³ Breast cancer is the most prevalent cancer in Iran⁴ and mortality of BC has been rising steadily in Iran.⁵ the burden of BC in Iranian women has been on the rise, too.⁶

The Central and Northern provinces of Iran are known to have the most Geographic distribution of BC.⁷ Different factors could influence breast cancer screening including: health insurance, high education, smoking,⁸ lack of knowledge about the screening programs, embarrassment, mistrust of health care, fear,⁹ cost of screening, fear of a cancer diagnosis,¹⁰ past screening behavior,¹¹ social determinants of health such as convenience, geography, etc.¹²

Advances in breast cancer screening program due to reduce in breast cancer mortality in USA, however the incidence of this cancer there is not reduction.¹³

A lack of belief about cancer screening can affect the screening behavior.¹⁴ Evidence shows that breast cancer screening performance rate is low in Iranian women.^{15,16} Kwok et al., Developed the Chinese Breast Cancer Screening Beliefs Questionnaire (BCSBQ) with 13 item, this questionnaire measures women's beliefs, attitudes and knowledge and towards breast cancer and breast cancer screening practices.¹⁷ Usually, researchers are looking for tools that best cover their concepts as thoroughly as possible. The BCSBQ is a valid and reliable tool in Korean, Arabic, African Australian, Chinese-Australian and Indian women.¹⁸⁻²¹

Since the different culture can affect the belief of people, it is necessary to identify the belief of women about breast cancer screening in order to increase participation of women in national breast cancer screening programs. Because BCSBQ is a short questionnaire measure the breast cancer screening belief of women and given the importance of identifying women's screening beliefs in screening projects for the early diagnosis of breast cancer in Iran, the goal of our study is to determine the Translation and psychometric testing Persian Version of BSBQ in Iranian women.

Materials and methods

This study was a cross-sectional methodological study, which was conducted during 2017-18 with the aim of psychometric evaluation of the Iranian version of the Breast Cancer Screening Beliefs Questionnaire (BCSBQ).

The minimum sample size required to perform the factor analysis was five to ten subjects for each item in the instrument.²² Thus, 300 women who were aged 18 years or older, and who attended three selected healthcare centers of Shahid Beheshti University of Medical Sciences, were selected in this study through a convenience sampling method. After obtaining consents from the subjects with inclusion criteria, they were included in this study. The inclusion criteria were: being Iranian women, residing in Tehran, being aged 18 years or older, and having no history of breast cancer. The exclusion criterion was: the women's lack of consent to complete the questionnaire. It should be noted that sampling was carried out in this study, after obtaining the ethical code (IR.SBMU.PHNM.1396.796) from the Vice Chancellor for Research at Shahid Beheshti University of Medical Sciences.

The information gathering tool included two parts:

- 1) Demographic information include: age, marital status, economic status, education level
- 2) The instrument was a 13-item BCSBQ, which had three domains as follows: Health check-up (4 items), Knowledge and perceptions about breast cancer (4 items), and Mammographic screening practices (5 items). In this questionnaire, each item had choices based on a 5-point Likert spectrum from "completely agree" to "completely disagree", which allocated to themselves scores from 1 to 5. After obtaining written permission from the developer of the instrument; Dr. Kwok, the original English version of the questionnaire was translated into Persian through a backward-forward translation procedure, by two people who had good command over written medical texts, and who were experienced in the translation of questionnaires. Next, the Persian version was reviewed and evaluated for the consistency of each item with its corresponding item in the English version. Then, the Persian version of the instrument was again translated into English, by two bilingual expert translators (a specialist in healthcare and a general translator), and the two English versions were compared. After review and making necessary corrections, a single English version of the questionnaire was obtained and sent to the original designer for final approval of the instrument (Figure 1).

After verifying the instrument in terms of translation, the form prepared to determine the face and content validity, was presented to 10 faculty members of Shahid Beheshti University of Medical Sciences. And after collecting their comments, Item (13) which was about linguistic problems in screening, was excluded from the questionnaire due to the absence of this problem in our society. The content validity index (CVI) of the questionnaire was determined by applying the comments of 10 experts on the basis of the Waltz index. In this process, the clarity, relevance and simplicity of the inflection were assessed on the basis of the four options

and the rates more than 0.79 were accepted. In this study, the CVI of all questions were more than 0.79. So all questions were accepted. In this study, SPSS 13 software (SPSS Inc., Chicago, IL) was used for data analysis. An exploratory factor analysis was used for the 12 items of the instrument, and a Maximum Likelihood Estimation and a varimax rotation to determine the factor structure of all items. The Kaiser-Meyer-Olkin (KMO) Criterion and Bartlett's Test were used to determine the suitability of data for factor analysis. To determine the internal consistency of the entire scale and its sub-scales, the Cronach's alpha coefficient was used. The questionnaires were put at the disposal of 20 women who were among the main participants at a two-week interval. The correlation between the scores, obtained from the two examinations, was determined using the intraclass correlation coefficient (ICC).

The LISREL 8.8 software was used for confirmatory factor analysis. In order to evaluate the goodness of fit of the 3-factor model of the BCSBQ, the following indices were used: chi-square, the chi-square to degrees of freedom ratio, Root Mean Square Error of Approximation (RMSEA), Goodness of Fit Index (GFI), Normed Fit Index (NFI), and Comparative Fit Index (CFI), and the Adjusted Goodness of Fit Index (AGFI).²³

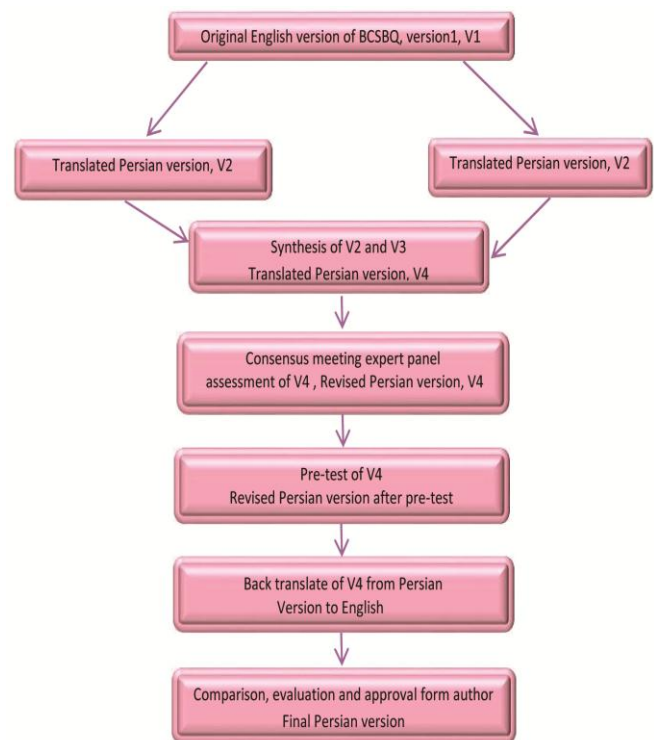


Figure 1. Flowchart of translation phases

Results

The findings of this study showed that the mean (standard deviation) of the participants' age was 35.18 (11.73), 82.3% of the subjects were married, 77.3% had an intermediate income to live on, 87% were housewives, 78% of the participants had high school diplomas or lower, the mean number of the participants' children was

1.98 (1.31), and the overall mean score of the questionnaire was 40.8 (10. 67).

Table 1 shows the characteristics of the participants. According to the exploratory factor analysis, the KMO test on the adequacy of the sample size was 0.83, which was at a desired level, and the Bartlett test was statistically significant ($P < 0.001$). In a factor analysis, the correlation between an item and the corresponding factor is represented by factor load. As an agreement, if the factor load is less than 0.3, the correlation between the factor and the item is considered weak, and it is better to omit the item, because it cannot explain the variable appropriately. A factor load between 0.3 and 0.6 is acceptable, and if it is greater than 0.6, it will be desirable.^{22,23} The results of the factor analysis showed that the rotation varimax consisted of three factors; the first factor contained four questions, the second factor four questions, and the third factor four questions. The three extracted factors made up 70.63% of the Variance of the 12 items in the study. Factor 1 had a special value of 5.02, which accounted for 41.89% of the variance. Factor 2 had a special value of 2.07, which accounted for 17.26% of

the variance. And Factor 3 had a special value of 2.07, which accounted for 11.47% of the variance. The results of the exploratory factor analysis are presented in Table 2. The indices GFI, RMSEA, χ^2/df , χ^2 , IFI and CFI show the acceptability of fit and/or goodness of fit of this scale.²³ Table 3 shows the values of the indices, and their acceptable thresholds

Table 1. The demographic characteristics of the participants

Variable	N (%)
Age* (yr.)	35.18 (11.73)
Education level	
Illiterate	34 (11.4)
Under diploma	92 (30.8)
Diploma	107 (35.8)
Academic	67 (22)
Marriage status	
Married	247 (82.3)
Single	53 (17.7)
Employment status	
Housewife	261 (87)
Employed	39 (13)
Economic status	
Good	16 (5.4)
Intermediate	232 (77.3)
Poor	52 (17.4)

Table 2. Results of exploratory factor analysis using rotated component Matrix

Factors and Items	Rotated component matrix
Attitudes towards general health check-ups (factor1)	1-2-3-4
1. When I feel healthy, I do not need health check-up.	0.75
2. If I have a healthy lifestyle, such as a proper diet and regular exercise, I feel that I will not need health check-up.	0.76
3. I will only go to a doctor for health check-up, when I have a health problem.	0.81
4. If I feel healthy, I do not need to go to a doctor.	0.75
Knowledge and perceptions of BC (factor2)	5-6-7-8
5. Breast cancer is like a death sentence that everyone is affected by, dies.	0.77
6. Breast cancer cannot be cured, and is associated with long-term suffering.	0.86
7. Even if breast cancer is diagnosed early, only a small number of patients can reduce their risk of death.	0.65
8. If a woman is destined to get breast cancer, she will get it, and cannot change her own destiny.	0.72
Barriers to screening (factor3)	9-10-11-12
9. I worry that mammography will harm my breast.	0.80
10. It is difficult for me to go to mammography in terms of commuting.	0.81
11. I do not want to undertake mammography. Because I have to take my clothes off, so my breasts can be seen by others.	0.89
12. It is a shame to do mammography.	0.82

Table 3. Goodness-of-fit indices for the three-factor model of the BCSBQ in participants

Statistical Index	χ^2	df	CFI	IFI	NFI	GFI	AGFI	RMSEA
Goodness	249.56	51	0.94	0.94	0.92	0.87	0.8	0.12
The threshold accepted of fit	-	-	>0.9	>0.9	>0.9	>0.9	>0.8	Good<0.08 0.08<moderate<0.1

Abbreviations: CFI, Comparative Fit Index; IFI, Incremental Fit Index; NFI, Normed Fit Index; Goodness of Fit Index ;GFI,RMSEA, Root Mean Square Error of Approximation; df Degrees of Freedom.

The results obtained from the confirmatory factor analysis along with the fit indices indicate the fit of the research data to the factor structure and the

theoretical infrastructure, which indicates the consistency of the questions with the desired dimensions, thus confirming the 3-factor structure of

the Persian version of the questionnaire (Figure 2).

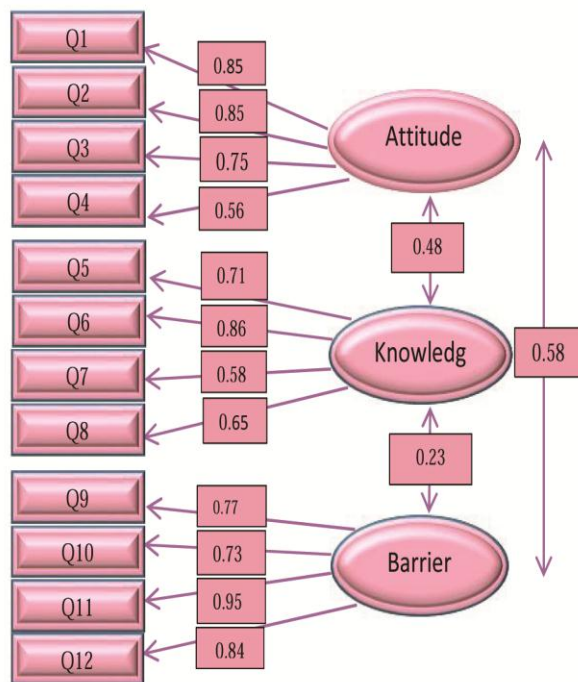


Figure 2. Triple -factor model for BCSBQ in confirmatory factor analysis

The internal reliability of the questionnaire was first calculated by Cronbach's alpha for the 12-item instrument, and then for its sub-domains. Table 3 shows the sub-domains of the instrument. Table 4 presents the results which show the reliability. The whole instrument had an appropriate Cronbach alpha equal to 0.78. To assess the reliability, the Persian version of the questionnaire was administered twice among a sample of 20 subjects at an interval of two weeks. The interclass correlation coefficient was obtained to be 0.93 within a range of 0.83-0.97.

Table 4. Results of cronbach's alpha and intral class corelation

Factor*	Cronbach's alpha	ICC (95% CI)	P
Attitudes towards general health check-ups	0.77	0.96 (0.92-0.98)	<0.001
Knowledge and perceptions of BC	0.79	0.88 (0.74-0.95)	<0.001
Barriers to screening	0.85	0.87 (0.71-0.94)	<0.001

Number of item is 4.

Discussion

This study was conducted for the first time in Iran with the aim of psychometric evaluation of the BCSBQ. The present study showed that this questionnaire could be used as a valid and reliable instrument for Iranian women. An exploratory and confirmatory factor analysis was used to determine the validity of the structure. Three important dimensions: attitude, knowledge, and barriers to screening were obtained. The KMO index equaled 0.83, and the Bartlett test became significant,

indicating the adequacy of the sample size in this study.

According to the reported indices, the fit of the model was evaluated to be good, and most of the factor loads were at minimally acceptable levels.

Kwok *et al.*, designed and evaluated the psychometric properties of the Breast Cancer Screening Beliefs Questionnaire in 2009. This 13-item questionnaire had a Cronbach's alpha of 0.76 in a Chinese-Australian women population. An exploratory factor analysis was used to extract the three factors: attitude, knowledge, and barriers to screening.¹⁷ In 2016, Kwok *et al.*, evaluated the psychometric properties of the BCSBQ in an Indian women population residing in Australia. The sample size was 242 in their study. The exploratory factor analysis revealed three factors. The breast cancer screening methods were considerably associated with attitudes towards health check-up. The perception about the breast cancer questionnaire was not considerably associated with clinical breast examinations and mammography. The perceived barriers to mammography were much less evident among women involved in knowledge about breast and clinical breast examinations. The results showed that the BCSBQ had satisfactory validity and internal consistency. Cronbach's alpha in the three subscales, was within the range of 0.81-0.91.²⁰ Kwok *et al.*, and evaluated the psychometric properties of the BCSBQ in an Arab women population, as well. The results showed that the Arabic version of the BCSBQ had a satisfactory validity and internal consistency. Cronbach's alpha in the three subscales, was within the range of 0.81 to 0.93.¹⁸ Kwok *et al.*, evaluated the psychometric properties of the BCSBQ in African-Australian women population. The sample size was 284 in that study. The results of the exploratory factor analysis showed that the African-Australian BCSBQ could be perceived as a 4-factor model. The third factor; that is, the "barriers to mammography", was divided into two separate factors; namely, "psychological" and "practical" barriers. The results showed that the African-Australian BCSBQ had both satisfactory validity and internal consistency. Cronbach's alpha in the three subscales was within the range of 0.84-0.92. In fact, the findings of that study, like those of other studies, showed that this instrument was a valid tool for measuring breast cancer screening beliefs.²⁴

Overall, the identification of personal factors such as: women's beliefs can help healthcare teams; particularly those in the country's screening programs, with early diagnosis and treatment of breast cancer, thus reducing excessive costs and disabilities caused by this disease.²⁵ One way of identification in general populations is the use of screening instruments which can be followed by a more accurate diagnostic process and necessary interventions. This instrument has this usability due to its appropriate psychometric conditions.

Among the strengths of this study is the psychometric evaluation of the short form questionnaire, which measures women's screening beliefs about breast cancer. Hence, this questionnaire can be used in the country's national screening programs. It is suggested that the psychometric properties of this questionnaire are evaluated in different parts of Iran, which have different cultures. The limitation of our study is that the method of sampling was not random; therefore the result of this study can't be generalized to all Iranian women.

Conclusion

The three-factor structure of the BCSBQ had appropriate validity and reliability among Iranian women. Considering its appropriate psychometric properties, this instrument can be employed in subsequent studies to measure women's screening beliefs in different parts of Iran.

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Ethical issues

None to be declared.

Conflict of interest

The authors declare no conflict of interest in this study.

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