

Original Article

Assessment of the validity and reliability of the Vietnamese version of the Breast Cancer Screening Beliefs Questionnaire

Cannas Kwok^{a,*}, Chun Fan Lee^b^a School of Nursing and Midwifery, Western Sydney University, Sydney, New South Wales, Australia^b Centre for Quantitative Medicine, Duke-NUS Medical School, Singapore

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ABSTRACT

Objective: The aim of this study was to evaluate the cultural adaptability and psychometric properties of the Vietnamese version of the Breast Cancer Screening Beliefs Questionnaire (BCSBQ).

Methods: A total of 253 women aged 18 years and older with no history of breast cancer was included in the analysis.

Results: Confirmatory factor analysis showed an adequate fit for the hypothesized three-factor structure of the original version of the BCSBQ. The results indicated that the frequency of women's breast cancer screening practices and their educational levels were significantly associated with "Attitudes towards general check-ups". Demonstrating the Cronbach's α of the three subscales ranged between 0.79 and 0.85 while the corrected item-total correlations for the hypothesized subscales ranged from 0.38 to 0.74, constituted a result which indicated that the Vietnamese version of the BCSBQ had satisfactory validity and internal consistency.

Conclusions: The Vietnamese version of the BCSBQ is a culturally appropriate, valid, and reliable instrument for examining the beliefs, knowledge, and attitudes about breast cancer and breast cancer screening practices among Vietnamese women living in Australia.

Introduction

Over the last decade, research on breast cancer and screening practices among Asian women has attracted considerable attention since epidemiological evidence indicates that the incidence rate of breast cancer among Asian women exceeds that of the Westernized world.¹ In Vietnam, the age-standardized incidence rates (ASR) of breast cancer nearly doubled from 16.3 per 100,000 in 2002 to 32.4 per 100,000 in 2012.² Similar patterns have been found in Hong Kong³ and South Korea.⁴

If breast cancer is to be tackled effectively, early detection by means of screening practices such as breast awareness, clinical breast examination and mammography, should play a vital role.⁵ In Australia, while much effort has been focused on promoting these breast cancer screening (BCS) practices, the rate of uptake has been sub-optimal, particularly among women from culturally and linguistically diverse (CALD) backgrounds.⁶ Other Western countries, for example the USA,⁷ the UK,⁸ and Canada,⁹ have similar concerns. In Australia, there are no national data which might indicate the rate of the participation in mammographic screening of each CALD group. However, international literature

covering this area suggests that Vietnamese-Australian women have low participation rates in BCS practices.^{10,11}

Examining BCS behaviours among women from CALD backgrounds is a complex area subject to the influence of factors including demographic¹² and psycho-social.¹³ Nevertheless, culturally-based health and cancer beliefs are crucial. International literature reveals that immigrant Vietnamese women in Canada¹⁴ and the USA¹⁰ tend to retain their traditional health beliefs which discourage their practice of and participation in BCS. Donnelly and colleagues indicate that Vietnamese-Canadian women have a more conservative concept of their bodily modesty and as a result they tend to regard as unacceptable the necessity of having to disrobe when undergoing mammographic screening.¹⁴ Immigrant Vietnamese women in the USA tend to believe that fatalism, having good health and being worry-free are the best contributors to their ongoing health. Thus, they regard attending a screening test when they are not experiencing any health issues as being unimportant or inviting troubles.^{10,15} All these point to the fact that immigrant Vietnamese women are underserved groups in BCS.

Over the last ten years, Vietnamese-born population has been one of the fastest growing ethnic groups in Australia. In 2020, they are the

* Corresponding author.

E-mail address: C.Kwok@westernsydney.edu.au (C. Kwok).<https://doi.org/10.1016/j.ajon.2021.11.003>

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fourth largest immigrant group in the country who are from non-English background country.¹⁶ Nevertheless, there has been no systematic examination in the existing literature of the impact of cultural beliefs on BCS behaviours among immigrant Vietnamese women. Remedying this lacuna demands the use of a valid and reliable instrument such as the Breast Cancer Screening Beliefs Questionnaire (BCSBQ) developed by Kwok et al.¹⁷ as a culturally-sensitive means of assessing immigrant women's knowledge of and attitudes towards breast cancer and screening practices and also to expose barriers which inhibit their participation in mammographic screening practices. This instrument has been tested and validated among immigrant women from Arabic,¹⁸ Korean,¹⁹ African,²⁰ Chinese²¹ and Indian²² backgrounds living in Australia and in Persian version²¹ as well. The overall results demonstrate the instrument has excellent internal consistency reliability as well as content and construct validity. The next challenge, which forms the focus of this study, has been firstly to translate the instrument into Vietnamese and secondly to evaluate the cultural adaptability and psychometric properties of the Vietnamese version of BCSBQ among Vietnam-born women resident in Australia.

Methods

A cross-sectional methodological study design using a self-reported questionnaire was employed to fulfil the study aim.

Translation

The back-translation technique was employed to translate the English version of the BCSBQ into Vietnamese. This is an international standard procedure for translating research instruments into other languages.²³ The English version of the BCSBQ was translated into Vietnamese by a professional translator. The Vietnamese version was then back-translated into English by a second professional translator. Both professional translators, fluent in Vietnamese and English, were qualified by the National Accreditation Authority for Translation and Interpreters in Australia. To ensure equivalence, the two versions were compared. After discussion, only minor changes resulted from this back-translation process which assisted in establishing the semantic equivalence of the instrument. To establish face validity, the translated version was then piloted among five Vietnamese Australian women with various demographic backgrounds. The consensus among these women was that the questions were clear and easy to understand.

Participants and recruitment

The target population was migrant women who self-identified themselves as being from a Vietnamese background. The inclusion criteria were that they be: (1) aged over 18 years, (2) resident in Sydney, (3) able to read or speak both Vietnamese and English and (4) having no history of breast cancer. A number of recruitment strategies were implemented. These included collaboration with Vietnamese community organizations that had regular meetings of female members, convenience sampling and setting up an information booth in a shopping mall regularly patronized by a good number of able Vietnamese women.

Data collection

In collaboration with the community organizations, the research assistant who was fluent in Vietnamese and English attended the weekly women's meeting including the couple and parents' group to invite women to participate in the study. Participants had a choice of filling in either the English or Vietnamese versions of the questionnaire and could either return it immediately or later place it in the sealed box located in the reception area. They were invited to take extra questionnaires

together with a stamped envelope to invite friends and relatives to participate in the study. Similar data collection processes were applied in the booth set up in the shopping mall. Data were collected during March to June 2019. The questionnaire took about 10–15 min to complete.

Ethical considerations

This study was approved by the appropriate human research ethics committee in the institutions to which the researchers were affiliated (Approval No. H13119). Regardless of what channel the participants used for recruitment, they were given a participant information statement in their chosen language and assured that participation was voluntary and that they could withdraw at any time without penalty or any deleterious effects on their relationship with the organization. No personally identifiable information would be collected. If they returned the questionnaire, this was taken as an indication of their consent to participate.

Instruments

The BCSBQ contains 13 items in three subscales: (1) attitudes to toward general health check-ups (four items), which explores the concept of having general health check-ups despite the absence of signs and symptoms of disease; (2) knowledge and perceptions about breast cancer (four items), which explores cultural beliefs relating to breast cancer, including fatalistic beliefs; and (3) barriers to mammographic screening practices (five items), which explore psychosocial and practical issues perceived by women to hamper their participation in BCS. These are hereafter referred to as the (1) Attitude, (2) Knowledge, and (3) Barriers subscales. The answer for each item was listed along a 5-point Likert scale ranging from “strongly agree” (score of 1) to “strongly disagree” (score of 5). According to the wording of the items, responding either “disagree” or “strongly disagree” was taken to indicate a more proactive approach toward general health check-ups, more accurate knowledge about breast cancer or fewer fatalistic attitudes and fewer perceived barriers to participating in mammographic screening practices. A brief description of the items is illustrated in Figure 1. Demographic data and screening practices were also collected.

Sample size

Burns et al.²⁴ recommend five to ten participants per item for factor analysis. As there are 13 items in the BCSBQ, having a maximum of 10 participants for each item indicated a need to recruit 130 women. To ensure an adequate final sample size, 428 women were invited to participate in the study, 259 of whom returned the questionnaire, giving a response rate of 60.5%.

Data analysis

The three subscale scores of the BCSBQ were computed by the mean response to the items within the subscale as previously applied on other populations.¹⁷ Missing values were imputed by the half-rule, i.e., the mean response to other items in the same subscale if half or more of the items were answered and valid.²³ Participants' demographic characteristics and the distribution of the subscale scores of the BCSBQ, were summarized using descriptive statistics. Floor and ceiling effects were evaluated using the proportions of subjects scoring 0 and 100, respectively. Substantial floor and ceiling effects suggest that a 5-point Likert scale might not be sufficient to clearly distinguish the responses at the two extremes.

A confirmatory factor analysis (CFA) was first performed to examine whether the data supported the 3-factor structure of designed by the instrument. Goodness of fit and the parsimony of the model were

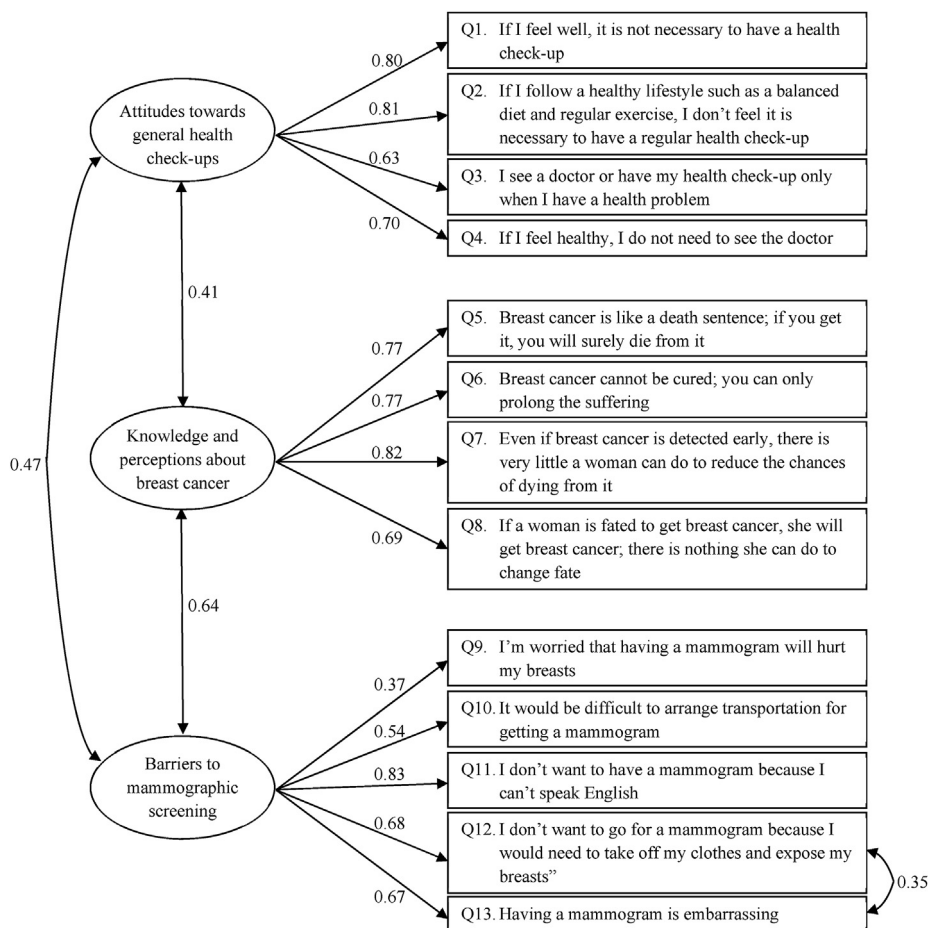


Figure 1. Path diagram of a confirmatory factor analysis of the Breast Cancer Screening Beliefs Questionnaire. The values correspond to the standardized estimates.

evaluated using various indicators, including the root mean square error of approximation (RMSEA), standardized root mean square residual (SRMR), comparative fit index (CFI), and non-normed fit index (NNFI).²⁴ We followed the common benchmarks in evaluating the adequacy of the factor model: RMSEA close to or less than 0.06, SRMR close to or less than 0.08, CFI close to or greater than 0.95, and NNFI close to or greater than 0.95.²⁴ Here, we considered “close to” because of the fluctuation of the cut-off values under different modeling conditions and other fit indices used.²⁵ Since items within the same subscale were correlated, covariance between items was added to the model based on the largest modification index to improve the goodness of fit when there were doubts about inadequate fit.²⁵ An exploratory factor analysis (EFA) was also planned in order to investigate the factor structure in case the above goodness-of-fit criteria were not satisfied. However, since the pre-specified criteria were all satisfied, no EFA was needed.

Construct validity was then examined by testing three sets of hypotheses regarding the association of the subscale scores with the frequency of breast screening practices and education level: (1) those who performed breast awareness exercises more frequently or had CBEs and mammograms would have a more proactive attitude toward general check-ups reflected by a higher score in the attitude subscale; (2) those who had a better education level would be more knowledgeable about breast cancer, thus obtaining a higher score in the knowledge subscale; and (3) having more screening practices was associated with fewer barriers to mammograms, resulting in a higher score on the barriers subscale. As the frequency of screening practices and education level were of ordinal-type data, Cuzick’s non-parametric test was used for testing the trend.²⁶ Item performance of the BCSBQ was also assessed. Good internal consistency was reflected by a Cronbach’s α between 0.7

and 0.9. This is because a low degree of homogeneity results in a low α value while item redundancy may lead to a too-high α value. Moreover, we used the corrected item–total correlations (r_{corr}) to assess convergent–divergent validity.²⁷

Results

A total of 259 Vietnamese-Australian women completed and returned the questionnaire. However, six had a history of breast cancer, and hence were excluded. The remaining 253 women were eligible to participate and were included in the analysis below. Their demographic characteristics are summarized in Table 1. The ages of the cohort ranged from 19 to 69, with a mean (standard deviation) of 44.7 (12.4) years. Collectively, they had lived in Australia for a mean of 9.0 (5.3) years. Most were married or living together with a partner (67.6%), had been born in Vietnam (98.4%) and spoke Vietnamese at home (95.3%). Less than a quarter had tertiary education (20.9%) and about a quarter rated their English proficiency as good or very good (24.9%).

All participants answered all 13 items, so imputation for missing values was not required. The distributions of the three subscales are summarized in Table 2. The Attitude and Knowledge subscales had a range from 0 to 100, and the Barriers subscale from 5 to 100. These subscales showed some ceiling effects of 3.56%, 13.83% and 7.51%, respectively.

The CFA of the hypothesized 3-factor structure of the BCSBQ resulted in a chi-square statistic = 146.9 (degrees of freedom = 62, $P < 0.001$), RMSEA = 0.073 (95% confidence interval [CI] = 0.058 to 0.089), SRMR = 0.063, CFI = 0.939 and NNFI = 0.924. After examining the Lagrange multipliers test, a covariance between Q12 and Q13 was added to the

Table 1
Demographic characteristics of the 253 participants.

Characteristics	n	%
Age (years)		
Mean (standard deviation)	44.7	(12.4)
Median (interquartile range)	44	(34–55)
19 or younger	1	0.4
20–29	30	11.9
30–39	63	24.9
40–49	59	23.3
50–59	69	27.3
60–69	31	12.3
Country		
Vietnam	249	98.4
Others	4	1.6
Language at home		
Vietnamese	241	95.3
English	12	4.7
Length of stay in Australia (years)		
Mean (standard deviation)	9.0	(5.3)
Median (interquartile range)	8	(5–12)
0–5	68	26.9
6–10	109	43.1
11–15	48	19.0
16–20	19	7.5
21–25	7	2.8
26 or above	2	0.8
Marital status		
Single	49	19.4
Married/defacto	171	67.6
Divorced/separated	14	5.5
Widowed	19	7.5
Education level		
Primary school or below	9	3.6
Secondary school	103	40.7
TAFE/college	88	34.8
Tertiary or above	53	20.9
Current employment status		
Unemployed and seeking work	24	9.5
Unemployed and not seeking work	45	17.8
Full time	82	32.4
Part time	82	32.4
Retired	20	7.9
Self-rated English level		
Very good	21	8.3
Good	42	16.6
Average	109	43.1
Little	65	25.7
Not at all	16	6.3

factor model. This updated model had a chi-square statistic = 105.4 (degrees of freedom = 61, $P < 0.001$), RMSEA = 0.054 (95% CI = 0.036 to 0.071), SRMR = 0.044, CFI = 0.968 and NNFI = 0.960. The final CFA model is shown in Figure 1.

The mean scores of the three subscales stratified by the frequency of breast screening practices and education level are shown in Table 3. In the Attitude subscale, the mean score increased significantly with the frequency of practices (all $P < 0.05$). Women with higher education levels also scored significantly more highly in the Knowledge subscale ($P < 0.001$). However, the Barriers subscale score did not show a significant association with the frequency of practices (all $P > 0.05$); instead, it was found to be significantly associated with higher education levels ($P < 0.001$).

Table 2
Distribution of the subscale scores of the 13-item Breast Cancer Screening Beliefs Questionnaire.

Subscale	Mean	Standard deviation	Minimum	First quartile	Median	Third quartile	Maximum	% at floor	% at ceiling
Attitudes towards general health check-ups	55.2	22.6	0	37.5	56.3	75.0	100	1.58	3.56
Knowledge and perceptions about breast cancer	69.8	20.9	0	56.3	75.0	81.3	100	0.40	13.83
Barriers to mammographic screening	64.5	20.9	5	50.0	65.0	80.0	100	0	7.51

The Cronbach's α of the three subscales ranged from 0.79 to 0.85 (Table 4). For the Attitude and Knowledge subscales, items correlated moderately to strongly with their own subscale (r_{corr} between 0.58 and 0.73) but only weakly with other subscales (r_{corr} between 0.18 and 0.43). Comparatively, r_{corr} between the Barriers subscale and its items were smaller, ranging from 0.38 to 0.74, whereas item Q11 had a correlation of 0.53 with the Knowledge subscale.

Discussion

Having a valid and reliable instrument is an important starting point if BCS practices are to be systematically used to examine factors associated with the screening behaviors of women. It is worth noting that our sample of Vietnamese-Australian women covered a wide age-range. While mammographic screening is targeted at women aged over 50,⁶ promoting BCS practices is vital among younger women because breast cancer can occur at any age⁵ and on this score, breast awareness is the only measure for early detection. Our study provides valuable insights into factors influencing BCS practices among Vietnamese-Australian women regardless of age, which include mammographic screening, breast awareness and clinical breast examination.

This study evidenced that the Vietnamese version of the BCSBQ demonstrated appropriate psychometric properties. As supported by the CFA, the originally 3-factor design structure of the BCSBQ was validated in this Vietnamese cohort. The three subscales namely “attitudes toward general health check-ups,” “breast cancer knowledge and perceptions,” and “barriers to mammographic screening,” are theoretically consistent with the original version. There were only minor floor and ceiling effects in the subscales of the BCSBQ, suggesting that the 5-point Likert scale is sufficient to distinguish responses at the higher and lower extremes.

In terms of reliability, the Cronbach's α ranged from 0.79 to 0.83, comfortably above the acceptable level of 0.70 as recommended by Streiner and Norman²⁸ revealing that the questionnaire had excellent internal consistency reliability under each of the three subscales with no indication of overlap among the items. This is consistent with previous validation studies using the BCSBQ in the Arabic,¹⁸ Korean,¹⁹ African,²⁰ Chinese,²¹ Indian,²² and Persian²⁹ versions (Table 5).

Our results also demonstrated good construct validity for the Attitude and Knowledge subscales as the corresponding hypothesized associations were significant and in the hypothesized direction. Women who performed BCS practices as recommended have more proactive attitudes in having health check-ups. Our result on this measure is supported by overseas studies demonstrating that immigrant Vietnamese women in the USA and Canada share a similar view in that they do not see the relevance of cancer screening while having no signs and symptoms or that they are feeling fit and healthy.^{9,10} This is also common among immigrant women regardless of cultural background.^{30,31} Such women do not subscribe to the concept of early disease-detection using revealed by screening practices. Nevertheless, while the Barriers subscale score did not show a linear relationship with the frequency of screening practices, which is not consistent with the pattern of previous validation studies in the Arabic,¹⁸ Korean¹⁹ and Chinese,²¹ groups. This warrants further investigation into the physical and/or psychological barriers to mammographic screening evident among by Vietnamese women immigrants living in Australia.

Table 3
Associations of the Breast Cancer Screening Beliefs Questionnaire subscale scores with frequency of breast screening practices and education level.

Item	<i>n</i>	Attitudes towards general health check-ups	Knowledge and perceptions about breast cancer	Barriers to mammographic screening
		Mean (SD)	Mean (SD)	Mean (SD)
Breast self-examination				
At least once a month	35	65.2 (14.6)	72.0 (17.5)	66.1 (19.3)
Once every few months	53	52.0 (20.2)	72.8 (19.4)	65.6 (20.3)
Once a year	106	57.8 (23.3)	68.9 (20.4)	65.4 (19.5)
Never	59	47.4 (24.7)	67.4 (24.6)	61.1 (24.8)
<i>P</i> value for trend		0.011	0.163	0.256
Clinical breast examination				
A year or less	34	62.9 (18.1)	74.6 (18.3)	67.9 (21.0)
More than a year and less than two years	45	60.0 (20.1)	68.8 (18.1)	67.0 (18.9)
Two to three years	30	51.7 (21.6)	59.4 (23.0)	58.8 (16.1)
More than three years	23	52.2 (26.4)	69.0 (20.2)	62.8 (21.1)
Never had one	121	52.7 (23.7)	71.5 (21.5)	64.4 (22.5)
<i>P</i> value for trend		0.024	0.708	0.521
Mammogram				
Once a year	12	63.5 (29.7)	80.2 (20.6)	74.6 (17.0)
Once every two years	39	64.4 (17.7)	67.6 (12.2)	69.9 (16.8)
Once every three years or more	56	53.3 (20.0)	62.8 (21.3)	59.7 (18.5)
Never had one	146	52.7 (23.5)	72.1 (21.9)	64.1 (22.6)
<i>P</i> value for trend		0.019	0.220	0.301
Education level				
Primary school or below	9	50.0 (27.6)	57.6 (14.6)	57.2 (31.3)
Secondary school	103	51.9 (22.0)	60.3 (21.8)	58.5 (18.4)
TAFE/college	88	55.3 (22.9)	73.2 (17.5)	67.7 (22.2)
Tertiary or above	53	62.3 (21.5)	84.6 (13.6)	72.2 (18.1)
<i>P</i> value for trend		0.013	<0.001	<0.001

Abbreviation: SD, standard deviation.

Regarding factor loading, one noticeable result is that an item in the Barriers subscales, viz Q11—“I don't want to have a mammogram because I can't speak English” appeared to be related to the Knowledge subscale as indicated by the moderately high corrected item–total correlations. This was indicated by their substantial loadings on not only the barriers subscale but also the knowledge subscale (0.60 and 0.53). Empirical evidence indicates that lack of English proficiency has strong associations with immigrants' health literacy.^{32,33} Clearly language barriers prevent immigrant women from assessing and understanding health information. Even though nearly three quarters of the participants in the study had lived in Australia for more than five years, only one quarter (24.9%) self-rated their English proficiency as either very good or good English, while 95.3% spoke Vietnamese at home. Apparently, language barriers hamper their ability to understand scientific knowledge about breast cancer and the importance of screening practices. This is in line with our results that educational levels have significant associations with the three subscales. Vietnamese-Australian women who are equipped with higher educational qualifications are more likely to have better English proficiency which could help them better comprehend the concept of early detection and scientific

Table 4
Cronbach's α and corrected item-total correlation for the subscales of the Breast Cancer Screening Beliefs Questionnaire.

Item	Attitudes towards general health check-ups	Knowledge and perceptions about breast cancer	Barriers to mammographic screening
Cronbach's α	0.83	0.85	0.79
Attitudes towards general health check-ups			
Q1	0.68	0.31	0.30
Q2	0.69	0.31	0.34
Q3	0.58	0.18	0.29
Q4	0.65	0.29	0.19
Knowledge and perceptions about breast cancer			
Q5	0.31	0.67	0.39
Q6	0.25	0.71	0.36
Q7	0.28	0.73	0.43
Q8	0.27	0.62	0.37
Barriers to mammographic screening			
Q9	0.11	0.22	0.38
Q10	0.18	0.24	0.47
Q11	0.36	0.53	0.60
Q12	0.31	0.36	0.74
Q13	0.30	0.37	0.73

Table 5
Cronbach's α for the subscales of the Breast Cancer Screening Beliefs Questionnaire in Arabic, Korean, African, Chinese, Indian, and Persian versions.

Item	Attitudes towards general health check-ups	Knowledge and perceptions about breast cancer	Barriers to mammographic screening
Arabic	0.93	0.90	0.81
Korean	0.86	0.88	0.80
African	0.92	0.91	0.77
Chinese	0.79	0.79	0.70
Indian	0.91	0.91	0.81
Persian	0.83	0.74	0.79

knowledge of breast cancer and overcoming of hesitancy about participating in screening services. Consistent with the existing literature, the education levels of Vietnamese women³² and women from other minority cultures in Western countries.^{34,35} are a strong determinant of their screening behaviours. Nevertheless, further study on a larger sample containing a greater variation in English proficiency, is warranted.

The satisfactory psychometric performances of the Vietnamese version of the BCSBQ prove that it is a culturally sensitive, valid, and reliable instrument for assessing Vietnamese-Australian women's beliefs, knowledge, and attitudes about breast cancer and BCS practices. This indicates that BCSBQ can provide health professionals, particularly oncology nurses, with a methodology for exploring factors systematically that impact on BCS practices among Vietnamese immigrant women. Such information is highly relevant for culturally-sensitive breast health education programs.

Limitations

Although the Vietnamese version of the BCSBQ shows promising results, several limitations have to be acknowledged. Firstly, although multiple recruitment methods were used, the generalization of our conclusions is limited by the fact that this convenience sample was drawn mainly from Vietnamese community organizations and passers-by in shopping malls. It is very likely that for example, socially isolated women were underrepresented. Secondly, the study utilized self-reported measures of BCS practices that could have been either over- or under-reported. Further studies with adequate verification of self-reported information built into their design are warranted.

Conclusions

Our study provides evidence that the Vietnamese version of the BCSBQ is a culturally sensitive, valid, and reliable instrument for assessing Vietnamese-Australian women's beliefs, knowledge, and attitudes about breast cancer and BCS practices. Having a valid and reliable instrument to examine the factors associated with BCS behavior and beliefs about breast cancer would be the first step to improve BCS rates among women in this cultural group.

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Declaration of competing interest

None declared.

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