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Cross-Cultural Adaptation and Psychometric Evaluation of the Pap Smear Belief Questionnaire in Iranian Women

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Abstract

Background: Beliefs of women play a very important role in efficacy of screening for cervical cancer. Therefore, it is necessary to investigate their points of view using appropriate tools with suitable validity and reliability. It seems that the Pap Smear Belief Questionnaire (PSBQ) can assess the attitudes and beliefs of women towards screening for Pap smear.

Aim: This study aimed to evaluate cross-cultural adaptation of beliefs regarding cervical cancer screening in Iranian women.

Method: In the present study, the cross-cultural adaptation was investigated in 318 married participants. Following the translation and re-translation processes of PSBQ, approval by author, and obtaining the views of the experts as well as participants, the face and content validities of questionnaire were determined qualitatively. Moreover, the construct validity was affirmed by exploratory and confirmatory factor analysis. The tool reliability was analyzed by internal consistency and test-retest methods.

Results: The construct validity of the questionnaire had four subscales (exam-related factors, benefits, barriers, and vulnerability). Cronbach's alpha was obtained as 0.93 and the intraclass correlation coefficient was 0.98, indicating the reliability of the Persian version of this questionnaire.

Implications for Practice: The Persian version of PSBQ had an acceptable validity and reliability among the Iranian female population. This reliable instrument can be used to assess the existing status, in addition to study the effectiveness of breast cancer screening beliefs.

Keywords: Cervical cancer, Pap smear, PSBQ adaptation, Psychometric, Screening beliefs

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Introduction

Cervical cancer is the fourth prevalent cancer among women around the world (1). Moreover, this cancer is the third common cause of death in the less developed countries (2). Human papilloma virus (HPV) is considered as the most prevalent risk factor for cervical cancer (3). The incidence rate of cervical cancer in Iran and other Muslim countries is low. However, the disease has a high morbidity rate due to detection in advanced stages (4).

In a meta-analysis study in Iran, the prevalence of HPV infection was reported to be 38.6% and a strategy to prevent this infection is concluded to be essential (5). In a study by Farzaneh et al. (2017) in Ardabil, Iran only 28% of the women aged 20-65 years had a history of pap smear (6). Today, cervical Pap smear and HPV test are recommended in women aged 30-65 years (7). Studies have shown that Pap smear is a highly cost-effective screening test for cervical cancer (8, 9).

Attitudes toward cervical cancer and referring for early diagnosis and screening services are deeply influenced by the cultural beliefs and norms (10). In Iran, lack of community-based approaches to cervical cancer screening, unawareness, misconception, and inappropriate health behaviors, in addition to the social and cultural issues could be named among the barriers of cervical cancer screening. The social and cultural factors include cultural invasion and asymmetry between tradition, modernity, religion, and cultural taboos (11). A systematic study reported that culture and religion are valuable factors contributing to the treat of cervical cancer screening (12).

Various questionnaires have been developed and validated so far in the field of cervical cancer screening beliefs. Urrutia et al. in 2013 performed psychometrics for CPC-28 questionnaire. The results showed that the questionnaire had six subscales, including barriers, causes of action, severity, need, sensitivity, and benefits. The variance of questions was 49% and the reliability of questions was 0.735 (13).

Guvenc et al. (2007) examined psychometric testing for the health belief model scale concerning cervical cancer and Pap smear test. They extracted five factors based on the results of factor analysis, namely Pap smear benefits and health motivation, Pap smear barriers, seriousness, susceptibility, and health motivation. Cronbach's alpha reliability coefficients and test-retest reliability coefficients for the five subscales were 0.62-0.86 and 0.79-0.87, respectively (14).

Ackerson et al. in 2017 reviewed the psychometric testing of Pap smear belief questionnaire. This questionnaire evaluates the beliefs and attitudes of women about Pap smear and cervical cancer. This study was conducted on 344 female students from the University of Midwestern. The questionnaire has four components of exam-related factors, benefits, vulnerabilities, in addition to risks and barriers. Furthermore, it entails 28 items measured by a five-point Likert scale indicating 5 for "strongly agree", 4 for "agree", 3 for "neutral", 2 for "disagree", and 1 for "strongly disagree". It should be noted that all the items were positively encoded. This questionnaire had acceptable and reliable reliability (15). It is crucial that the health system staff, health researchers, and policy makers should use valid tools (16).

A wide range of personal reasons is a barrier to women participating in screening for cervical cancer. Many factors affected by the social attitudes of women lead them to believe that they are not at risk for cervical cancer (17, 18). Therefore, it seems that determining the screening beliefs in women about cervical cancer, Pap smear, and various educational interventions can play an important role in promoting women health and reducing mortality due to cervical cancer.

This questionnaire can measure the different dimensions of women attitudes toward screening for cervical cancer. On the other hand, the cultural structure of each society affects people points of view. Consequently, screening beliefs in women are of high importance for determining participation of women in screening programs. Furthermore, understanding the beliefs of individuals might justify their behaviors and resolving the screening beliefs of women can be effective in cervical cancer prevention programs (20).

Given the simple and conceptual values and considering the importance of screening for the early diagnosis of cervical cancer, it is of high significance to identify women beliefs that have role in national screening patterns. With this background in mind, the present study aimed to evaluate cross-cultural adaptation of the PSBQ tool as a step forward in promoting women health.

Methods

The present study was performed during 2017-18 to examine the cross-cultural adaptation of cervical

cancer screening using the 28-item Pap Smear Belief Questionnaire. The research population was all the women who referred to health centers affiliated to Shahid Beheshti University of Medical Sciences, Tehran, Iran. The minimum sample size required for conducting factor analysis is 5-10 samples per item (21). Therefore, the sampled for exploratory factor analysis included 318 women aged 18 years and older who were referred to the selected health centers affiliated to Shahid Beheshti University of Medical Sciences.

The participants were selected by convenience sampling method. The inclusion criteria entailed being Iranian married woman aged over 18 years. The exclusion criteria encompassed a history of hysterectomy, as well as dissatisfaction for completing the questionnaire.

The first step was forward translation of the PSBQ. Initially, the agreement was obtained for translating the original version of questionnaire from the relevant author. Then, according to the WHO standard guidelines, two authors fluent in English translated the questionnaire independently. Translators compared the translations in order to reconcile and obtain a Persian version suitable for the patients.

Ten skilled experts reviewed the Persian version regarding consistency of each item with its English counterpart. Afterwards, the Persian sample was retranslated into English (backward translation) and sent to the tool designer to resolve any particular problem in terms of adapting the translation to the main tool.

The second step was PSBQ psychometrics. In order to evaluate the face validity and quality of translation, in addition to modifying the probable defects, the questionnaire was delivered to 30 women who referred to the selected health centers of Shahid Beheshti University of Medical Sciences. Therefore, some questions were revealed to be vague in terms of expression and concept. We consulted with the inventors of the questionnaire about how to express these questions. Comments were reviewed at a meeting with the translators and expert commentators.

In this study, the content validity index of questionnaire was determined applying the comments of ten experts based on Waltz and Basel content validity index. This process examined the clarity, relevance, and simplicity of each item based on the four-point indicator and the scores of higher than 0.79 were accepted (22).

Moreover, factor analysis was used to measure and determine the construct validity. Following examining the internal consistency, the expressions of internal relations in the questionnaire between the analyzed data were determined. Then the correlated variables were summarized as new variables named factor. Factor is a new variable that comes up with each of these categories and contains more solid expressions (23). The confirmatory factor analysis was carried out with 200 individuals presenting to health centers affiliated to Shahid Beheshti University of Medical Sciences.

The internal consistency and stability were utilized to determine the reliability of questionnaire. After assessing the internal consistency of instrument expressions and factor analysis of the remaining expressions, the Cronbach's alpha coefficient was calculated for each factor and the total instrument. We used the re-test method for checking the tool stability and the same people completed the questionnaire at different times. To examine the stability reliability of the questionnaire Persian version, it was distributed twice to 35 individuals over a two-week period. Cronbach's alpha > 0.7 was considered to be acceptable. The data collection method was self-completion questionnaire.

Prior to sampling in this study, the authors explained the study objectives to the participants and obtained informed consents. The current study was approved by the ethics code of IR.SBMU.RETECH.REC.1396.430 from the Deputy of Research at the Shahid Beheshti University of Medical Sciences.

All the data were statistically analyzed using SPSS version 17 and Lisrel 8.8 software. The Chi-square test, Cronbach's alpha coefficient, t-test, KMO index and Bartlett's test of sphericity, as well as exploratory and confirmatory factor analysis were applied for statistical analysis.

Results

The findings of this study showed that the mean age of 318 participants was 36.9 ± 11.3 years. Moreover, 31.5% of the individuals had high school education and lower, while 68.5% had academic education. In addition, 19.5% were employed and 80.5% were housekeepers. Among the participants, 77.6, 15.9, and 6.5% had incomes enough, less than enough, and more than enough for the life expenses, respectively. The mean number of children was 2.5 ± 1.4 and the mean score of the

questionnaire was obtained as 90.1 ± 14.5 .

In the current study, the content validity index of the questionnaire based on the opinions of ten experts using the Waltz and Basel content validity index for all questions was over 0.79. Accordingly, all the 28 items were accepted. We evaluated the face validity in this study by a qualitative approach. In this method, each item was examined by three options regarding the fit and relevance of items, ambiguity and inadequate perceptions, and difficulty in understanding concepts from the viewpoint of the target group. After returning the translation to the designer, the designer and research team changed the term "health service provider" in questions 4-9 to "health care provider".

According to the exploratory factor analysis, the KMO test was 0.87 for sampling adequacy, which was in the desired level and Bartlett's test was statistically significant ($P=0.001$). In the factor analysis, the correlation between an item and the corresponding factor is represented by factor loading. As an agreement, when the factor loading is < 0.3 , the relationship between the factor and the item will be considered as poor and it will be better to delete the item because it cannot explain the variable well. The factor loading is acceptable as 0.3-0.6 and in case it is higher than 0.6, it will be desirable (21, 24).

The results of factor analysis demonstrated that the Extraction Method: Principal Axis Factoring consisted of four factors. The four extracted factors included 58.46% of the variance of the 28 items in the study. The first factor called Pap smear-related factors involved questions 1-13 with about 30.45% variance. The second factor named Pap smear barriers covered questions 25, 26, 27, and 28 with variance of 11.22%. The third factor known as Pap smear benefits entailed questions 14, 15, 16, 17, and 18 with 9.39% the variance. The fourth factor called Pap smear vulnerability included questions 19, 20, 21, 22, 23, and 24 having a variance of 7.38%.

The results of exploratory factor analysis are presented in Table 1. In this exploration, item 14 had no suitable place; however, was positioned logically in the main factor. The confirmatory factor analysis was completed with 200 samples. Four items, including 14, 19, 20, and 21 had no suitable load factoring in the first round and the model indices had poor fit. In the second round of factor analysis, the three abovementioned items were eliminated and as a result four factors were reported with desirable fitness indices. RMR, RMSEA, χ^2/df , χ^2 , IFI, and CFI indicated the acceptability of fitness or optimal fit of this scale (24).

Table 1. Exploratory factor analysis of Pap smear belief questionnaire using varimax rotation

No.	Item	Factor 1	Factor 2	Factor 3	Factor 4
1	When the Pap smear service provider carries out the procedure, I feel worried and afraid.	0.639			
2	I feel that it is a disgrace to me, when the Pap smear service provider or caregiver carries out the procedure.	0.634			
3	I feel that it is a disgrace to me, when the service provider or caregiver does not explain what he or she does during the Pap smear.	0.675			
4	I do not trust health care providers.	0.738			
5	It is very embarrassing to take a Pap smear.	0.72			
6	The service provider or caregiver asks me some personal questions on the Pap smear examination table that I do not want to think about.	0.696			
7	When I lie on the Pap smear examination table, I remember the alarming things that happened to me.	0.665			
8	The people who take Pap smears are rude.	0.579			
9	I do not trust health care provides unless I know them.	0.593			
10	When the provider carries out the Pap smear hastily or rushes, I feel worried and afraid.	0.565			
11	I am afraid to take a Pap smear, because I do not know how it will be done.	0.465			
12	Taking a Pap smear is very time consuming.	0.427			
13	I am afraid to take a Pap smear, because I might find out that there is a problem.	0.354			

Continous of Table 1.		
14	I only go to female providers (to take a Pap smear).	0.601
15	Taking a Pap smear is the best way to find early abnormal changes to cervical cells.	0.847
16	If they find cancer cells in my cervical Pap smear, treating cervical cancer may not be so bad (hard).	0.761
17	Taking a Pap smear will help early detection of abnormal cervical cells.	0.835
18	Taking a Pap smear reduces the risk of death due to cervical cancer.	0.701
19	I feel that I will get cervical cancer sometime in my life.	0.678
20	It is likely that I will get cervical cancer.	0.73
21	It is very likely that I will get cervical cancer in the next few years.	0.585
22	I am not at risk for cervical cancer, because cervical cancer has never been seen in my family.	-0.514
23	I am not at risk for cervical cancer, because I always have protected sex.	-0.498
24	If I take care of my health through exercise and eating right, I will not be at risk for cervical cancer.	-0.431
25	I do not know how I can take a Pap smear.	0.585
26	I am much older than needing to have Pap smears on a regular basis.	0.72
27	I have more important problems than taking a pap smear.	0.799
28	I cannot keep in mind to plan for a Pap smear.	0.745

Table 2 shows the rate of indicators. The results of confirmatory factor analysis using fitness indicators revealed that the research data fitted the factor structure and the theoretical basis. The latter finding indicates alignment of the questions with the desired dimensions and confirms the four-factor structure of the Persian study questionnaire.

Figure 1 verifies the four-factor confirmatory factor analysis of the PSBQ scale. The internal consistency of the questionnaire was first calculated by Cronbach's alpha for the whole tool and then for the subscales. The results of reliability test are demonstrated in Table 3. Total tool had the suitable Cronbach's alpha of 0.93. In addition, The intraclass correlation coefficient was 0.98, which was acceptable. The results for the subscales are summarized in Table 3.

Table 2. Study tool model fitting indices

Fit indices	Estimated values	Standard values
Chi-square (X^2)	866.48	--
Degrees of Freedom	246	--
Root Mean Square Error of Approximation (RMSEA)	0.08	> 0.05
Normed Fit Index (NFI)	0.9	< 0.08
Incremental Fit Index (IFI)	0.93	> 0.9
Comparative Fit Index (CFI)	0.93	> 0.9
Goodness of fit index (GFI)	0.81	> 0.9

Table 3. Calculating the reliability of Pap smear belief questionnaire in women who referred to health centers affiliated to Shahid Beheshti University of Medical Sciences in 2017

Factors	Cronbach's alpha	Intraclass correlation coefficient	Confidence interval of intraclass correlation coefficient	Significance level
Pap smear-related factors	0.8	0.97	0.0-95.98	< 0.001
Pap smear barriers	0.85	0.844	0.0-71.98	< 0.001
Pap smear benefits	0.77	0.92	0.0-85.96	< 0.001

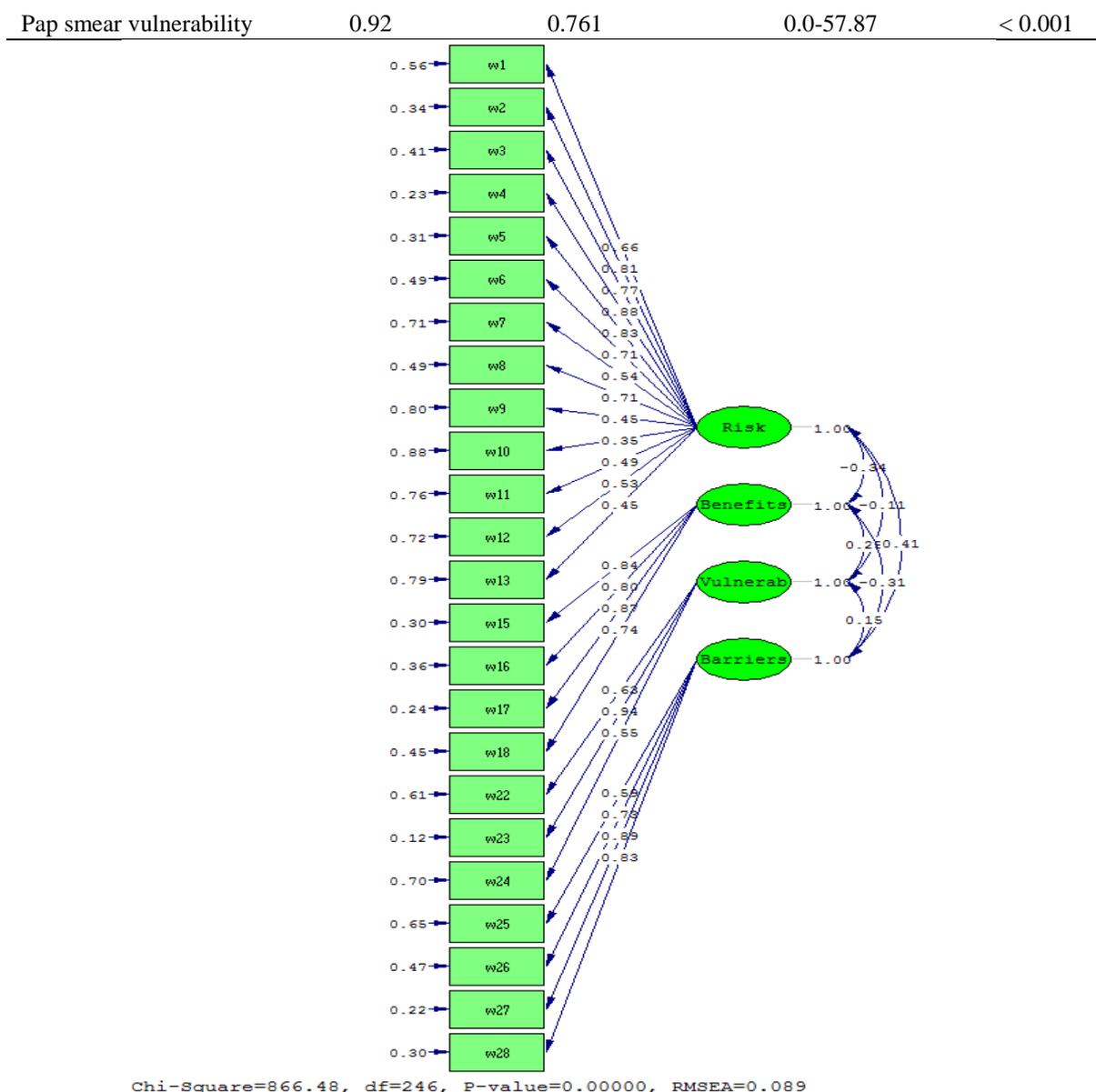


Figure 1. Confirmatory factor analysis of four-factor Pap smear belief questionnaire

Discussion

This is the first study on PSBQ psychometrics in Iran. The exploratory and confirmatory factor analyses were used to determine the construct validity. In the exploratory factor analysis, four obtained important dimensions, namely Pap smear-related factors, benefits, barriers, and vulnerability included 58.46% of the variances. Ackerson et al. in 2017 investigated the the PSBQ psychometrically and found that four dimensions involved 46% of variances. The results of our study, similar to the findings of these authors showed that the main components were Pap smear-related factors, benefits, barriers, and vulnerability (15).

The results of confirmatory factor analysis indicated that the conceptual model is fitted with deletion of four questions 14, 19, 20, and 21 in the Iranian females. Regarding the reported indicators, the model fit was appropriate. Cronbach's alpha and intraclass correlation coefficient indicated the reliability of this questionnaire. Generally, in the present study, after eliminating the four mentioned questions, PSBQ-24 is a valid and reliable tool in our Iranian women society.

In contrast to our study, each of the 28 items had a good fit in the study performed by Ackerson et al. (15). Given that this questionnaire has not been evaluated in other parts of the world for psychometrics, it was impossible to compare its psychometrics.

Evidence suggests that beliefs of women toward health can be among the most important predictor

factors for cervical cancer screening (25, 26). It seems that to promote referrals for Pap smear testing, appropriate educational programs are required to be designed in order to raise awareness and to modify inappropriate beliefs and backgrounds (27).

One of the strength points of the current study was that it could be used to identify beliefs of women regarding Pap smear screening in cervical cancer screening programs. On the other hand, the weak points of this study were that the research was not conducted in different ethnic groups residing in different parts of Iran. Further researches are recommended in this regard. Another limitation of this study is impossibility of generalizing the results due to the study location that was limited to Tehran city. Assuring the psychometrics of the test requires reviews in more diverse environments. Consequently, it is suggested that the validity and reliability of the questionnaire be checked in other cities of Iran.

Implications for Practice

According to the results of this study, the Persian version of PSBQ has an acceptable validity and reliability among the Iranian female population. This tool can be used to evaluate the beliefs toward Pap smear and screening for cervical cancer in the future studies in Iran. This reliable instrument can be applied to assess the existing status and to study the efficacy of breast cancer screening beliefs.

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Conflicts of Interest

The authors declare no conflicts of interest.

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