Original Article

Sexual behavioral abstine HIV/AIDS questionnaire: Validation study of an Iranian questionnaire

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ABSTRACT

Background: This study was designed to assess the validity and reliability of the designed sexual, behavioral abstinence, and avoidance of high-risk situation questionnaire (SBAHAQ), with an aim to construct an appropriate development tool in the Iranian population. **Materials and Methods:** A descriptive–analytic study was conducted among female undergraduate students of Tehran University, who were selected through cluster random sampling. After reviewing the questionnaires and investigating face and content validity, internal consistency of the questionnaire was assessed by Cronbach's alpha. Explanatory and confirmatory factor analysis was conducted using SPSS and AMOS 16 Software, respectively. **Results:** The sample consisted of 348 female university students with a mean age of 20.69 ± 1.63 years. The content validity ratio (CVR) coefficient was 0.85 and the reliability of each section of the questionnaire was as follows: Perceived benefit (PB; 0.87), behavioral intention (BI; 0.77), and self-efficacy (SE; 0.85) (Cronbach's alpha totally was 0.83). Explanatory factor analysis showed three factors, including SE, PB, and BI, with the total variance of 61% and Kaiser–Meyer–Olkin (KMO) index of 88%. These factors were also confirmed by confirmatory factor analysis [adjusted goodness of fitness index (AGFI) = 0.939, root mean square error of approximation (RMSEA) = 0.039]. **Conclusion:** This study showed the designed questionnaire provided adequate construct validity and reliability, and could be adequately used to measure sexual abstinence and avoidance of high-risk situations among female students.

Key words: HIV, questionnaires, sexual abstinence, sexual behavior

INTRODUCTION

HIV/AIDS has been recognized as one of the most important public health problems in the recent past,[1,2] especially in Asian countries such as Malaysia,[3] China,[4] Thailand, and Iran.[5] According to the World Health Organization's (WHO's) report of HIV, Iran is categorized as one among the countries with gradually accumulating levels of infection.[6]

Preventing HIV infection is one of the top priorities in 2010 to lead a healthy life.[7] Three transmission ways have been identified for the disease: Sexual activity with an infected person, contact with infected blood through sharing injection needles, and mother-to-infant infection.[8] In order to prevent HIV transmission through sexual activities, which accounts for 85% of the disease, the three following options have been recommended: Abstinence, faithfulness, and condom use, among which the first one is the safest.

Due to the lack of global access to AIDS treatment and also based on the fact that HIV/AIDS transmission requires a

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behavioral process, behavioral change interventions are the best approach to prevent the spread of the disease.[9,10]

Since most health problems are closely related to human behavior, behavioral theories and models can provide insights into finding ways to prevent health problems such as HIV/AIDS.[11] Most of the studies conducted have been based on cognitive-behavioral, health belief models, and theories such as social cognitive theory (SCT) and theory of reasoned action (TRA).[12] Considering the results, and in order to increase the efficiency of the models, a selective mixture of aforementioned theories has been employed in the present study.

In his survey of AIDS-behavior change theories, Noar (2007) mentioned 13 theories used in the studies, including belief- and intervention-based, message-driven, and AIDS-related theories, and other common hygienic behavior changes.[13] Some researchers used a questionnaire based on behavior change theories or models such as motivation-behavioral skills model (IMB),[14] social cognitive theory (SCT),[15] and the theory of reasoned action (TRA).[16] Furthermore, the constructs such as knowledge,[17] attitude,[18] self-efficacy (SE),[19] behavioral intention (BI),[20] and high-risk sexual behavior[21] were used in some studies.

Like most Islamic countries, sexual affairs are considered as taboo in Iran.[22] Therefore, given the cultural differences between the Western countries and Iran and the sensitive nature of the disease, the HIV/AIDS behavior change questionnaires derived from the previous studies conducted in non-Islamic countries cannot be applied here. Although the validity and reliability of the questionnaire has been confirmed in a previous study,[23] this study was conducted only with male students. However, to our knowledge, no study has been carried out with female students so far. As females, in comparison with males, are physiologically more vulnerable to HIV/AIDS, female students were selected as the target group.[24] Considering the lack of appropriate tools and questionnaires, the study focused on designing and validating a culturally suitable sexual abstinence questionnaire among unmarried Iranian female students.

MATERIALS AND METHODS

Participants and study design

The study was cross-sectional in design and was conducted from February to June 2010. The study subjects were undergraduate female students studying at Tehran University. The criteria based on which the participants were selected were as follows: Age range of 15-25 years, single status, living alone, and residing in Tehran for at least 1 year at the time of the study. Those with physical disability and those reluctant to participate in the study were excluded.

For achieving an appropriate score maximum fitness and predicting the number of students, the participants were randomly selected from the three areas of humanities, engineering, and science at the University of Tehran. Then, the participants were selected through cluster systematic sampling (with each class as one cluster). For each question, a minimum of 10 samples were used according to Munro's method, and 348 female students were randomly selected to reach construct validity. Descriptive (mean, standard deviation, and Cronbach's alpha) and inductive statistics (exploratory and confirmatory factor analysis) functions of SPSS and AMOS ver. 16 were used to analyze the data.[25]

Instruments

A self-administered questionnaire was used which comprised the following four parts: Socio-demographic characteristics, SE regarding sexual abstinence, perceived benefits (PB) toward sexual abstinence, and Behavioral intention (BI). The demographic information included age, residency region, family income, parents' education, and previous knowledge about HIV. There were four SE questions about individual restraint, avoidance of risky situations, and the behavioral skills of saying no. These questions were also designed according to the Iranian standardized general SE questionnaire.[26] For unifying the results and facilitating analysis, the questions were designed with five options ranging from strongly agree to strongly disagree. For each item, a typical 5-point Likert scale ranging from strongly disagree (1) to strongly agree (5) was used. The scale of PB consisted of six items measuring individual and social benefits of abstinence, risky behavior avoidance, negative answer to risky offers, and high-risk situation avoidance. Most questions were derived from the studies of Ghafari[23] and Miller *et al*.[27] Furthermore, one question with regard to the features of female students in the studied society was added to the aforementioned questions.

BI questions consisted of four items based on the dual behavior theory of Gibbons and Gerrard[28] and a domestic questionnaire designed by Ghaffari *et al*. These questions were about the BI of abstinence, a negative answer to risky advances, and avoidance of highly risky situations. Also, given the fact that the participants were young and prone to highly risky situations, one of the questions required them to give their own opinions about their willingness to avoid high-risk situations.

Statistical analysis

Descriptive statistics, Cronbach's alpha, and exploratory and confirmatory factor analysis functions of SPSS and AMOS ver. 16 were used to analyze the data.

Ethical issues

The study was approved by the Ethics Committee of Tehran University and ethical principles were adhered to throughout the study. After the researchers explained the purpose and procedures of the study to the participants, they consented to participate in the study.

RESULTS

In order to determine the face validity, the questionnaire was distributed to 30 students with similar characteristics. They were asked to pinpoint the weaknesses and ambiguities of the questionnaire, comment on its clarity, rationality, brevity,

and appropriateness, and finally, improve it. Content validity ratio (CVR) was applied to assess the extent of experts comment upon the clarity, rationality, brevity and appropriateness of itThen, the questionnaire was given to 20 specialists in the fields of health education, nursing, medicine, and psychology to take the experts' ideas into account. Content validity was assessed by each panel member with a 3-item Likert scale (the items were "necessary," "useful but not necessary," and "unnecessary"). In case an item was marked as "unnecessary," the experts' suggestions for modification or elimination were sought.

The CVR equal to 0.80 or above was considered satisfactory. The original questionnaire included 122 items in 11 separate parts. The number of questions was reduced to 50 after measuring the CVR.

Reliability

In order to verify the reliability of the questionnaire, Cronbach's alpha score was calculated. Cronbach's alpha or the internal consistency for PB, BI, and SE variables was found to be 0.87, 0.77, and 0.85, respectively. All these values indicate the desirable level of the scales.

In order to determine the construct validity of the questionnaire, exploratory and confirmatory factor analysis was used. One way of investigating construct validity is by running a factor analysis for identifying clusters of questions related to the instruments. This method helps the researcher to determine whether the available tool measures one construct or several ones.[29]

The exploratory factor analysis using principal components analysis with varimax rotation was used to determine compliance and naming of the extracted factors. Using all observations ($N = 348$), the factor analysis helped in identifying three decisive factors with a variance greater than 61% and 88% of Kaiser–Meyer–Olkin (KMO), both of which are appropriate indicators of factor analysis. After inserting three retention factors in the orthogonal varimax rotation, each of the factors was given a name and estimated using the probability method. Based on the loadings, and also the content of questions, the three factors were identified as SE, BI, and PB, respectively. Table 1 summarizes the data and loading factors. As presented in the chart, only the first three values have Eigen values more than one.[29] Six PB questions were omitted, and four SE and four BI questions were used in the model; at the final stage and after determining factor analysis, one SE question was deleted.

After running exploratory factor analysis, in order to confirm the supposed factor structure of the measure as well as the contribution of each question in measuring the components of self-efficacy, BI and PB were analyzed using Amos Software. Table 1 shows the most important parameters of the measuring components of the questionnaire. The most important fitness statistics is the Chi-square statistic. This shows the disparity between the observed and predicted measures (matrices). The insignificance of the statistics indicated the model's fitness with the data, but the pitfall of the statistics is that it is sensitive to the sample size, which means that with larger sample sizes, the possibility of the statistics being insignificant *t* decreases. Values less than 0.05 for the index root mean square error of approximation (RMSEA), values above 0.9 for goodness of fitness index (GFI), and adjusted goodness of fitness index (AGFI) were used as the criteria for model compliance with the observed data [Table 3].[30]

As it was stated, the model's of the goodness of fitness indexes are all acceptable. Therefore, the confirmatory factor analysis also approved the construct validity of the questionnaire [Figure 1].

Demographic information

On the whole, 348 female students participated in the study. The mean age of the participants was 20.69 ± 1.63 years. Relevant demographic information is presented in Table 2.

The average of CVR for the entire questionnaire was 0.85. The CVR for the subscales of PB, BI, and SE was calculated to be 0.83, 0.84, and 0.89, respectively. The time needed for completing the questionnaire was about 6 min.

DISCUSSION

Considering that there is lack of valid and reliable questionnaire on the behavioral changes of HIV/AIDS among Iranian females, we aimed to design an appropriate abstinence questionnaire and determine its validity and reliability.

Islamic religious beliefs play an important role in people's attitude to the disease.[31] This point has been taken into account to a lesser extent in the questionnaires developed in the Western countries. For example, some Iranians believe that avoiding unsafe sexual encounters would give them better chances of getting married in the future.

Other studies on the validity and reliability of domestic questionnaires have mainly investigated the knowledge of

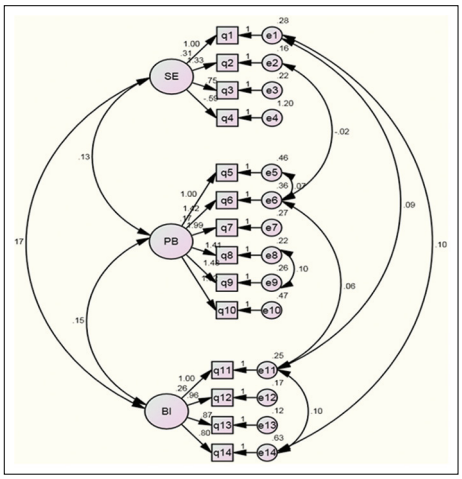

Figure 1: Structural equation fitness to model

Table 1: The results of the exploratory factor analysis with varimax rotation

	Extracted factors		
	SE	BI	PB
Q1SE=I can abstain before marriage	0.609		
Q2SE=I can avoid any risky behavior even if it is easily accessible	0.759		
Q3SE=I can easily avoid any situation which puts me in a high-risk behaviors	0.751		
Q4SE=I'm able to say "no" to any dangerous suggestion offered by my friends or other people	−0.611		
Q1BI=I decide not to have any sexual behaviors before getting married		0.751	
Q2BI=I decide to say NO to any future suggestions which are probable to provide me with HIV/AIDS, whether offered by my friends or any other person		0.662	
Q3BI=I decide to avoid being in a dangerous situation in the future		0.634	
Q4BI=Suppose the following case: You are in a party in which most of your friends are doing risky behaviors. A close friend offers you to do a risky thing, what would you do? 1. I'd agree 2. My approval depends on the situation 3. I'd say "no, thanks" 4. I'd leave the party		0.728	
Q1PB=Sexual abstinence keeps me from being infected with HIV/AIDS and other venereal diseases			0.589
Q2PB=Sexual abstinence before marriage saves me from God's punishment			0.688
Q3PB=Sexual abstinence before marriage earns me a respectful reputation in the community known as virtuous and religious-conscious			0.801
Q4PB=Refusing dangerous suggestions increases my self-confidence			0.816
Q5PB=Refusing dangerous suggestions provides me with peace of mind and success in my education			0.782
QPB6=Standing far from dangerous situation brings me better chances of marriage in the future			0.696

The values less than 0.3 are not shown, SE = Self-efficacy, PB = Perceived benefits, BI = Behavioral intention

people and their behaviors and attitudes toward HIV, and reported the reliability of the scales.[32-34] For instance, in a study by Khatoni *et al*., face-to-face web-based training was employed to verify the content validity of nurses' knowledge questionnaire by the experts, and also, the reliability of the questionnaire was confirmed through test–retest (0.9).[35] Furthermore, the Cronbach's alpha for the HIV/AIDS knowledge and attitude questionnaire developed by DiClemente *et al*. was reported to be 0.72.[36] In the study conducted by Nije-Carr on HIV/AIDS Knowledge, Attitudes, and Beliefs Patient Questionnaire (HAKABPQ), the internal consistency of the questions was shown to be higher than 0.7.[37] Also, the internal consistency of HIV-related knowledge, attitudes, and sexual risk-taking behaviors was reported to be 0.073 in the study by Ugarte *et al*.[38] In the study of Koopman *et al*. (1990), both the knowledge and belief instruments were indicated to have a high internal consistency, test–retest reliability, and successfully avoided ceiling effects.[39]

The highest reported figure was 0.96 for the validity of St Andrews Sexual Knowledge and Attitudes Instrument (SASKAI), which was conducted among female employees by Kappa test.[40] Of course, the high internal consistency is a result of high level of similarity among the questions. In the study of Hughes and Admiraal entitled "Systematic review of HIV/AIDS knowledge measures," the results showed low reliability and a validity rate of HIV knowledge questionnaire. In general, the measuring instruments of knowledge, attitudes, and beliefs about HIV do not have a high level of internal consistency and have rarely been tested by factor analysis.[41]

Lux and Petoza designed a questionnaire based on which the Cronbach's alpha was estimated to be 0.64 and 0.79 for healthy sexual BI and SE of sexual discussion, respectively.[42] In another study conducted by Mahoney Thombs and Ford, the Cronbach's alpha SE subscale for using condoms was reported to be 0.91. Thus, all these questionnaires show their eligibility for application in related studies.[43] The scale of Mukoma *et al*.,[44] which was applied to evaluate school-based HIV/AIDS intervention in South African courtiers and Tanzania, reported a Cronbach's alpha of higher than 0.5. Regarding sexual behaviors, the Cronbach's alpha was lower than 0.5, based on which the author verified the utility of the scales. In a similar study conducted by Ghafari *et al*., the alpha values for a 10-scale instrument about HIV/AIDS prevention were 0.69, 0.78, and 0.74 for SE, PB, and BI, respectively, which were lower than those of the present instrument.[45]

It is worth noting that the alpha values between 0.8 and 0.9 show a high internal consistency and the alpha values of 0.7 and higher present a good internal stability.[46,47] In the present study, the Cronbach's alpha was between 0.77 and 0.87, indicating a good internal correlation of the instrument. Also, the reliability coefficient of the scale was approximately 0.85, which is satisfactory when seen in the light of the studies listed. There were three main measures of sexual behaviors: Abstinence, number of sexual partners, and condom use, which

Table 2: The characteristics of the study sample

Variables	Studied students (*N*=348)	
	M±SD	*n* (%)
Age (years)	20.69±1.63	-
Father's education		
Illiterate		12 (3.4)
Primary		31 (8.9)
Secondary		19 (5.5)
Senior high school		94 (27)
College or academic		192 (55.2)
Mother's education		
Illiterate		12 (3.5)
Primary		63 (18.2)
Secondary		35 (10.1)
Senior high school		116 (33.4)
College or academic		121 (34.9)
Unknown		1
Residency		
Tehran	-	160 (46)
Other cities	-	188 (54)
Living status		
Alone	-	4 (1.1)
With their friends	-	179 (51.4)
With their family	-	163 (46.8)
Other	-	5 (0.6)
Income status		
Poor		3 (0.9)
Middle class		72 (20.9)
Well-to-do		240 (69.8)
Rich		29 (8.4)
Unknown		4
Previous knowledge about HIV		
Well informed		143 (41.1)
Moderate information		149 (42.8)
Poor information		56 (16.1)

M±SD = Mean±standard deviation, *n* = Number of students

Table 3: Goodness fitness indexes of the sexual abstinence behavior of HIV/AIDS questionnaire

AGFI	GFI	RMSEA	*P* value	χ
0.939	0.961	0.039	0.003	102.78

*SE=Self efficacy, PB=Perceived benefits and BI=Behavioral intention
AGFI = Adjusted goodness of fitness index, GFI = Goodness of fitness index, RMSEA=Root mean square error of approximation

were measured[48] In some articles, the psychological measures of sexual abstinence instrument have not been mentioned.[49-51]

One of the strengths of the study was using different methods of testing reliability and validity and exploratory and confirmatory factor analysis. It should be noted that the questionnaire was optimal in terms of structure validity and scale clustering and the goodness of fitness indexes. Other researchers are suggested to work on the construction of theories of behavior change scale in Islamic contexts as well as to research into different groups of adolescents, youth, and occupations with the risk of HIV/AIDS infection.

CONCLUSION

This study have showed that the sexual behavioral abstinence, and avoidance of high-risk situation questionnaire (SBAHAQ) questionnaire can be used as a valid and reliable tool to measure abstinence and avoidance of high-risk situations regarding HIV/AIDS infection. However, it is recommended to test the validity of the tool in various communities such as students, scholars, etc.

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