



Original Article

A More Understanding about AIDS: Design and Assessment of Validity and Reliability of Several New Scales

Ali Zakiei¹ , Habibolah Khazaie¹ , Saeid Komasi^{2*} ¹Department of Psychiatric, Sleep Disorders Research Center Faculty of Medicine Kermanshah, Kermanshah University of Medical Sciences, Kermanshah, Iran²Department of Psychiatric, Clinical Research Development Center, Imam Reza Hospital, Kermanshah University of Medical Sciences, Kermanshah, Iran**ARTICLE INFO**

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***Corresponding Author:**MSc in Psychology. Email:
s_komasi63@yahoo.com**ABSTRACT****Introduction:** Given the high cost of AIDS, research on high-risk behaviors associated with AIDS is an essential requirement today. Therefore, the present study aimed to construct and standardize tests associated with AIDS-related risky behaviors.**Methods:** To assess the validity of the questionnaires, the experts' viewpoints from different domains were qualitatively and quantitatively included. Additionally, to assess the reliability of the questionnaires, a sample of 31 subjects was selected and then examined on two separate occasions in a fortnight's time. Then, the validity and reliability of the instruments were assessed in a sample of 475 subjects.**Results:** The results of exploratory factor analysis showed that for AIDS health literacy and AIDS risk perception questionnaires two factors are extractable; while for the questionnaires of self-efficacy in controlling risk behavior and controlling risk behavior associated with AIDS one factor is extractable. Finally, 14 items were approved for each of the AIDS health literacy and self-efficacy in controlling risk behavior questionnaires; while 13 items were approved for each of the controlling risk behavior associated with AIDS and AIDS risk perception questionnaires. Each of the four questionnaires had a good internal consistency (Cronbach's Alpha > 0.70). Interclass Correlation Coefficient (ICC) amounts related to the test-retest reliability were greater than 0.80, which indicates the reliability of the instruments.**Conclusion:** According to the results of the present study, it was concluded that all four AIDS-related questionnaires enjoyed acceptable validity and reliability.**Citation:** Zakiei A, Khazaie H, Komasi S. A more understanding about aids: design and assessment of validity and reliability of several new scales. J Caring Sci 2019; 8 (4): 249-56. doi:10.15171/jcs.2019.035**Introduction**

HIV infection has become a major global health problem in recent years¹ Moreover, according to the global statistics, 6000 people per day and five youth per minute get infected with HIV.² There is a similar situation in Iran, too. The Iranian Ministry of Health expressed that 46.5% of the HIV-stricken people were in the 25-34 age range.³ Although high-risk sexual behavior and drug use are more prevalent among the youth than other age groups, they are not well-informed enough about the HIV infection and risk behavior⁴ and lack of knowledge, beliefs, and skills often lead to the inefficiency and instability of preventive programs in this regard.⁵

Assessing one's knowledge, attitudes and performance are necessary prior to AIDS preventive planning.⁶ we decided that knowledge would be addressed in a construct called 'health literacy.' In fact, health literacy refers to one's capacity to receive, perceive and interpret primary information and health services, which are required for appropriate decision-making.⁷ Health literacy includes factors such as reading ability, counting skills, the ability to understand the instructions of health (medical), the ability to navigate the health care system, and the ability to surf the net for health information.^{8,9} A set of skills and competencies, including reading and

comprehension of medication labels, calculating medication intervals, and following the basic instructions of self-care, are all indicative of health literacy.¹⁰

AIDS health literacy meant 'one's ability to receive, understand and interpret the basic information, measures to prevent HIV infection, and health-related services tailored to this end. Since risk behavior is associated with HIV infection, it is considered in public health programs.

On the other hand, to prevent the infection, a perception of the causes of risk behavior is crucial.¹¹ Therefore, developing a valid instrument to evaluate the control of risk behavior is urgently required. Behavior control denotes one's perception of control over behavior, a reflection of the facilitators and barriers to the previous behavior.¹² In this study, risk behavior referred to 'the ones known by studies as the main causes of HIV transmission, including unsafe sex, intravenous drug addiction, tattooing and unsanitary dental care.'¹³⁻¹⁵

Self-efficacy in controlling risk behavior was another variable addressed in the study. This variable indicates that the youth should be able to reject offers to consume narcotics and abandon risk elements to protect oneself against risky behaviors. The results of a study confirmed a strong association between self-efficacy and risk behaviors.¹⁶ According to the social-cognitive theory, self-efficacy beliefs play significant roles in showing risk

behavior.¹⁷ Self-efficacy is one's confidence in one's personal abilities.¹⁸ Besides, it is a key factor in the adoption of a new behavior at all ages, and the self-efficacy of any behavior can be specifically generalized to the very same behavior.¹⁹ One's ability to limit risk behaviors associated with AIDS is called 'one's self-efficacy in controlling risk behaviors.'²⁰ So, in the study, self-efficacy in controlling risk behavior meant 'one's belief in one's capabilities to reject offers to do narcotics and adopt risky and unsafe sexual behaviors, or one's belief in one's capabilities to resist the temptations to do narcotics or to adopt risky and unsafe sexual behaviors. The correlation between self-efficacy and AIDS preventive behavior has been verified, and this variable lessens the risk behavior leading to AIDS.'²¹⁻²³

Poor risk perception is regarded as a factor reducing struggle in certain behavior, such as risk behavior. For instance, in studies conducted on AIDS, sexual contacts without using condoms are seen as a risk behavior,²⁴ and one who does not recognize this risk behavior has a poor risk perception. In the psychosocial and cognitive models, risk perception is regarded as a basic variable in safe sexual behavior.²⁵ The results of several studies were indicative of the fact that low AIDS risk perception resulted in risk behavior.²⁶⁻²⁸ As for the risks of AIDS, beliefs are the core of understanding one's incentive to do or abstain from AIDS-related behavior,²⁹ most HIV prevention programs target one's perception of this disease.³⁰ In many models, such as the protection motivation theory,³¹ health belief model,³² and social cognitive theory,³³ AIDS risk perception is a major predictor of behavior. Some are of the opinion that the risk perception can be considered as an attribute that assesses the probability of a particular incident and the severity of its consequences.³⁴

Another factor that needs to be considered is the risk perception variable and the level of personal perception of AIDS danger. Previous studies conducted into measuring risk behaviors associated with AIDS^{20,35,36} have assessed only one aspect of the relevant factors, while the risk behavior has certain complexities that cannot be understood merely through measuring one factor. Some efforts have been made in Iran to develop a questionnaire about AIDS, in which some have dealt with measuring the university students' knowledge and attitudes towards AIDS,³⁷⁻³⁹ and some others have dealt with AIDS prevention among adolescents.⁴⁰ However, two major points that are worth mentioning here are: 1) these questionnaires have examined only one aspect of AIDS, and 2) they have been used among a certain population, whereas more tools are needed for greater understanding of AIDS, and a sort of tools should be prepared which can be used for all walks of life in societies.

It seems that by identifying the predictive factors of risk behaviors, some fundamental steps can be taken to prevent AIDS. Also, considering the effects of drug addiction and sexual intercourse on AIDS prevalence and the urge to identify the causes of such behaviors, this issue must be widely dealt with in Iran. Given that AIDS has

many social outcomes and economic costs, it is vital to prevent and reduce the incidence of HIV infection. Obviously, this issue requires more understanding of the high-risk behaviors related to AIDS. Thus, in order to understand the nature of the disease and provide preventive measures, it is necessary to conduct appropriate studies in this area. Any research, in turn, requires standardized tools. Therefore, the present study aimed to construct and standardize tests associated with AIDS-related risky behaviors. These tests are separate and independent from each other according to the nature and theories. So, in the present study, 4 scales were created under the titles AIDS health literacy, self-efficacy in controlling risk behavior, AIDS risk perception, and controlling risk behavior associated with AIDS and their validity and reliability were examined.

Materials and methods

The present project was a methodological study conducted on the residents of Kermanshah, Iran, to design and investigate the psychometric characteristics of four AIDS-related questionnaires: AIDS health literacy, self-efficacy in controlling risk behaviors, AIDS risk perception, and controlling risk behaviors associated with AIDS.

Furthermore, the questionnaires were designed according to the scientific procedures accredited in the psychometric field.⁴¹ First, after going through the previous studies about the topic, twenty items were written for each of the constructs through brainstorming (in April, 2015). Initially, theories on health promotion behaviors were studied by the research team. These theories included social-cognitive theory, 18 protection motivation theory³¹ and health belief model.³² The main concepts were formed based on these theories. Then, search and review were conducted based on the above-mentioned concepts in connection with AIDS-related behaviors.¹³⁻²⁸ In the next step, the item drafts were prepared and provided to specialists in health, psychology, sociology, statistics, and literature fields.

Given that AIDS-related behaviors have different psychological, social and health aspects, we invited specialists from the different fields.

In the next step, the content validity was checked, using qualitative and quantitative methods. Since the content validity of the present study was determined through the experts' viewpoints, various views were taken into consideration, including the Biostatistics (an expert holding PhD), Psychology (two psychologists with PhD's and two others holding M.A. degrees), Infective Disease (an expert with PhD), Psychiatry (one psychiatrist holding PhD), Health Education (one expert holding a PhD and another master's degree), Sociology (one expert with a master's degree.), Social Welfare (one expert with a master's degree), and Persian Literature (an expert holding PhD). The last one was invited to help with comparative investigation of the items' content with regard to Persian grammar). Next, some changes were made to the items according to the comments on grammar, appropriate

vocabulary, necessity, importance, and proper phrasing. Content Validity Ratio (CVR) and content validity index (CVI) were applied quantitatively to check the content validity. To this end, fifteen experts were requested to check each of the items based on a three-point scale (proper, partly proper, and not proper). To determine the lowest ratio value, those items with CVR higher than 0.49 remained or else they were excluded and for CVI the criterion was 0.79.⁴² Furthermore, factor analysis (exploratory factor analysis and principal components analysis) was employed to examine the validity of the questionnaires. To do so, 500 of the residents of Kermanshah, Iran, were selected through cluster sampling, considering the statistical blocks in the cross-country census conducted in 2013. The data collection process at this stage was carried out in September 2015.

In addition, to examine the reliability of the instruments, both internal consistency and stability methods were employed. To measure the internal consistency, the Cronbach's alpha was used, and the stability assessment was done through test-retest. To this end, a sample of 31 subjects was selected and then examined on two separate occasions in a fortnight's time. To check the reliability of the questionnaires, the Pearson correlation coefficient was applied.

The subjects were in the 18-30 age range (the average age was 26.32 and had been living in Kermanshah for a minimum of five years. The sample size determination in the exploratory data analysis (EDA) followed the general rule of sampling, i.e., the number of subjects should always be greater than the number of items used in questionnaires, 43 in which a range of 5 to 20 participants are considered for each question.⁴⁴ Hence, according to Steven's theory and considering the number of items in each questionnaire, 500 subjects were selected as the sample. In the present study, some ethical issues were taken into consideration, the research goals were explained to the participants of the study, their informed consents were taken, and they were assured that their information would remain confidential. It should be noted that the study was approved by the Ethics Committee of Kermanshah University of Medical Sciences. (Code: KUMS.REC.1395.69).

Results

Having reviewed the existing literature and consulting with experts, we wrote twenty items for each of the constructs through brainstorming. Then, the items were examined by experts and the ones with overlapping concepts were merged. Then, the items that did not match the cultural issues were excluded or modified. Finally, the number of items for each construct was as follows: 15 items for AIDS health literacy, 15 items for self-efficacy in controlling risk behaviors, 14 items for AIDS risk perception, and 16 items for controlling risk behaviors associated with AIDS. The first three questionnaires were on a six-point Likert scale (never, very little, little, to some extent, much, and very much), and the AIDS risk

perception was on a five-point Likert scale (strongly disagree, disagree, neutral, agree, and strongly agree).

Further, after considering the experts' feedback and CVR calculations, some of the items were excluded, and the final number of items in each construct was as follows: 13 items for AIDS health literacy, 13 items for self-efficacy in controlling risk behaviors, 14 items for AIDS risk perception, and 14 items for controlling risk behaviors associated with AIDS. The questionnaires were distributed among a sample of 500 subjects, and then the data related to 475 of them were recognized as authentic (58.1% females (Table 1).

Table 1. Socio- demographic characteristics of participants included in analyses

Variable	N (%)
Gender	
Male	277(58.3)
Female	198(41.7)
Education	
Secondary	56(11.8)
High school diploma	173(36.4)
Bachelor	192(40.4)
Graduate	54(11.4)
Marital Status	
Single	224(47.2)
Married	251(52.8)
Occupation	
Unemployed	203(42.7)
Student	85(17.9)
Employee	187(39.4)
Age group	
>20	37(7.8)
21-25	137(28.8)
26-30	134(28.8)
>30	167(35.2)

The exploratory factor analysis (extraction method: principal axis factoring) was performed for the questionnaires, and KMO index was 0.867 for AIDS health literacy. In addition, the Bartlett's test of sphericity was 2030.⁴³ and was significant at the level of 0.001, justifying the factor analysis based on the correlation matrix (Table 2). The results of the exploratory factor analysis (extraction method: principal axis factoring) of AIDS health literacy questionnaire demonstrated that two factors could be extracted from this questionnaire and all items had acceptable factor loading (> 0.40). The value of KMO for self-efficacy in controlling risk behavior was 0.880, and the Bartlett's test of sphericity was 1627.29 and was significant at the level of 0.001, justifying the factor analysis based on the correlation matrix. The results of the exploratory factor analysis (extraction method: principal axis factoring) of self-efficacy in controlling risk behavior questionnaire revealed that one factor could be extracted from this questionnaire and all items had acceptable factor loading (> 0.40) except for the second item. The value of KMO for controlling risk behaviors associated with the AIDS questionnaire was 0.789, and the Bartlett's test of sphericity was 1404.88 and was significant at the level of 0.001, justifying the factor analysis based on the correlation matrix (Tables 2,3). The results of the exploratory factor

Table 2. Total variance explained for variables

Initial eigenvalues	AIDS health literacy		Self-efficacy	Controlling	AIDS risk perception	
	Factor1	Factor2			Factor2	Factor1
Total	4.75	1.05	1.03	1.03	1.35	3.35
% of Variance	36.54	8.05	7.93	7.38	9.66	23.96
Cumulative %	36.54	56.87	58.61	60.24	45.29	23.96
KMO	0.867		0.880	0.789	0.740	
Bartlett's test of sphericity	2030.43		1627.29	1404.88	1023.65	
P- value	0.001		0.001	0.001	0.001	

Extraction method: principal axis factoring

Table 3. The results of exploratory factor analysis (factors weight)

Scales Items	Health literacy (13 items)		r ^a	Self-efficacy (13 items)		r ^a	Controlling (14 items)		r ^a	Risk perception (14 items)		r ^c
	Factor 1 (Comprehension)	Factor 2 (Assessment)		Factor 1	Factor 2		Factor 1	Factor 2 (Behavioral)		Factor 2 (Cognitive)		
1	0.79		0.71	0.73	0.62	0.53	0.42			0.33	0.41	
2	0.81		0.75	0.30	0.40	0.60	0.44			0.42	0.19	
3	0.66		0.67	0.68	0.46	0.58	0.45			0.47	0.30	
4	0.48		0.51	0.51	0.46	0.30	0.28			0.46	0.45	
5	0.57		0.60	0.77	0.71	0.50	0.63	0.66			0.62	
6	0.72		0.68	0.48	0.52	0.59	0.60	0.43			0.45	
7	0.49		0.48	0.58	0.51	0.41	0.45			0.31	0.35	
8	0.72		0.67	0.61	0.63	0.42	0.46	0.50			0.46	
9	0.62		0.62	0.66	0.65	0.61	0.58	0.60			0.60	
10		0.55	0.51	0.43	0.53	0.43	0.48	0.47			0.53	
11		0.47	0.46	0.52	0.43	0.42	0.37	0.28			0.40	
12		0.49	0.44	0.60	0.54	0.67	0.60	0.53			0.55	
13		0.64	0.38	0.49	0.51	0.55	0.49	0.54			0.57	
14						0.53	0.53			0.30	0.38	

^aCorrelation with total score P<0.001

analysis (extraction method: principal axis factoring) of controlling risk behavior questionnaire indicated that one factor could be extracted from this questionnaire and all items had acceptable factor loading (> 0.40) except for the fourth item. The value of KMO for AIDS risk perception questionnaire was 0.740, and the Bartlett's test of sphericity was 1023.65 and was significant at the level of 0.001, justifying the factor analysis based on the correlation matrix (Tables 2,3).

The results of the exploratory factor analysis (extraction method: principal axis factoring) of the AIDS risk perception questionnaire revealed that two factors could be extracted from this questionnaire and all items had acceptable factor loading (>0.40) except for the first, seventh, eleventh and fourteenth items.

As shown in Table 4, two factors with a value greater than 1 have been extracted for the AIDS health literacy questionnaire (Comprehension and Assessment). The special value for the first factor is 4.75 and for the second factor it is 1.05. The first factor explains 36.54% of the items variance and the sum of both factors explains 56.87% of the items variance. A special value of 1.03 was obtained for the self-efficacy in controlling the risk behavior questionnaire, which explains 58.61% of the total variance.

On the other hand, a special value of 1.03 was obtained

for the self-efficacy in controlling risk behavior associated with the AIDS questionnaire, which explains 60.24% of the total variance. In addition, the results indicate that two factors with a value greater than 1 have been extracted for the AIDS risk perception questionnaire. The special value for the first factor is 3.35 and 1.35 for the second factor. The first factor explains 23.96% of the items variance and the sum of both factors explains 45.29% of the items variance.

Then, the questionnaires were distributed among a sample of 31 subjects (14 females and 17 males) who participated voluntarily in the study. Moreover, the average age was 25.72, and the participants were asked to fill out the questionnaires on their own. The respondents were asked to record a private code on their questionnaires without disclosing it to anyone, which was done just for comparing the results with those of the second stage conducted after two weeks.

In Table 4, the Interclass Correlation Coefficient (ICC) between stage 1 and 2 and the Cronbach's alphas are shown. These results are related to the reliability check of the questionnaires through the internal consistency and stability methods. Furthermore, the Cronbach's alpha and test-retest were utilized to evaluate the internal consistency and stability, respectively. As shown in Table 4, ICC amounts related to the test-retest reliability were

Table 4. The results of internal consistency and stability of the questionnaires

Variable	Stability		Internal Consistency		Cronbach's alpha (n=475)	p
	ICC ^a	P	Stage1 ^b	Stage2 ^c		
AIDS health literacy	0.84	0.001	0.80	0.56	0.81	0.001
Self-efficacy in controlling risk behavior	0.93	0.001	0.92	0.84	0.85	0.001
Controlling risk behavior associated with AIDS	0.87	0.001	0.72	0.80	0.77	0.001
AIDS risk perception	0.87	0.001	0.85	0.74	0.70	0.001

^aICC = Interclass Correlation Coefficient, ^bFirst assessment related to the reliability, ^cSecond assessment two weeks after the first

Greater than 0.80 for all four variables, which indicates the stability of the instruments. The Cronbach's alpha was used to check the reliability of the questionnaires. The results of Table 1 showed that the reliability of all four questionnaires was acceptable. The correlation coefficient between the variables, mean and standard deviation of the sample under study are shown in Table 5 (n=475).

The results of Table 5 showed that the correlation coefficient between AIDS health literacy and self-efficacy in controlling risk behaviors was 0.32, 0.31 between AIDS health literacy and controlling risk behavior, 0.72 between self-efficacy in controlling risk behavior and controlling risk behavior, 0.42 between AIDS health literacy and AIDS risk perception, 0.40 between AIDS risk perception and self-efficacy in controlling risk behavior, and between AIDS risk perception and controlling risk behavior it was 0.51. Further, these correlation coefficients were significant at the level of $P < 0.001$.

Table 5. The correlation coefficient between variables, mean and standard deviation of the sample under study (n=475)

Variable	1	2	3	4	Mean (SD)
1. AIDS health literacy	1				50.44 (8.90)
2. Self-efficacy in controlling risk behavior	0.32	1			52.52 (11.22)
3. Controlling risk behavior associated with AIDS	0.31	0.72	1		57.48 (9.46)
4. AIDS risk perception	0.42	0.40	0.51	1	42.06 (70.1)

Discussion

Given that the availability of instruments for measuring variables is of the essence in any studies and due to lack of valid and stable instruments about AIDS across in Iran, the present study aimed to design four AIDS-related questionnaires, that is to say, AIDS health literacy, self-efficacy in controlling risk behaviors, AIDS risk perception, and controlling risk behaviors associated with AIDS, and assessed their validity and reliability. Although some studies have been conducted in this regard in Iran, they have all been dealing with awareness of and attitudes towards AIDS and have been mainly one-dimensional.²²⁻²⁴

It is worth mentioning that the earlier instruments have dealt with certain groups, whereas those in the present study addressed all walks of life. First, twenty items were considered for each of the variables. Then, the experts in Sociology, Psychology, Biostatistics, and Medicine were consulted since an issue like AIDS encompasses a wide range of dimensions, including Sociology, Psychology, Biostatistics, etc.

In the present study, in addition to collecting the experts' views, an open debate was provided to quantify their views because the possibility of exchange and expression of ideas was provided for in this method. After collecting the experts' views and measuring CVR and CVI, we excluded some of the items, and the final number of items in each construct was as follows: 13 items for AIDS health literacy, 13 items for self-efficacy in controlling risk behaviors, 14 items for AIDS risk perception, and 14 items

for controlling risk behaviors associated with AIDS. Next, the questionnaires were distributed among a sample of 31 subjects and examined on two separate occasions in a fortnight's time. The results of the correlation between the two stages of the test were indicative of the reliability of the instruments.

The validity of the questionnaires was examined once again through factor analysis in a sample of 457 subjects. The results of KMO and the Bartlett's test of sphericity confirmed the factor analysis model and were indicative of its suitability. The lowest factor weight required to verify an item depended on the number of tools and eigenvalue.⁴⁵ Therefore, a cutting point of 0.40 was determined as the lowest factor weight required for items to remain in the questionnaires. In the four questionnaires, some items were excluded as follows: the seventh and eleventh items in AIDS health literacy, the second item in self-efficacy in controlling risk behaviors, the fourth item in controlling risk behaviors associated with AIDS, and the first, third, seventh, eleventh, and fourteen items in AIDS risk perception. On the other hand, the results of the correlation coefficients between each of the items, the total score of the questionnaires, and significant relationships between variables were indicative of real relationships between variables as well as the reliability of the questionnaires. Therefore, four questionnaires were appropriately reliable, and one of the advantages of this research was applying various methods of validation, exploratory factor analysis, appropriate sampling and selecting subjects from different groups, including school students, university students, people with low levels of education and general public, people with various professions, and so on who represented the Iranian youth.

However, the sample was selected only from Kermanshah, which compromised the possibility of generalizing the results to the whole society. Therefore, it is recommended that the validity and reliability of these questionnaires be rechecked in other countries, especially those located in the Middle East.

The results of the retests demonstrated that the questionnaires had high retest reliability, indicating that the statements of the questionnaires will not be influenced by external factors, and the scores would remain stable over time. Some studies have been conducted on AIDS in Iran. For example, in a study conducted by Eskandari et al.,⁴⁶ the validity and reliability of an international AIDS questionnaire for Iranian students were examined, whereas a wide range of samples was studied in the present work. In another study conducted by Lotfi et al.,⁴⁷ by the title of 'Developing a Valid and Reliable Instrument to Predict the Protective Sexual Behavior in Women at Risk of Human Immunodeficiency Virus,' the population under study included only women and its questionnaire measured only the sexual behavior, whereas the present study examined all AIDS-related risk behaviors. In an American study by Brener et al.,⁴⁸ the validity and reliability of the youth risk behavior survey questionnaire were evaluated and all aspects of risk behaviors were

measured and the statistical population consisted of high school students, whereas in the present study, controlling the AIDS-related risk behaviors was measured.

Additionally, there were a lot of different cultural issues and verbal restrictions in terms of sexuality, which made it impossible to study various behaviors directly. Therefore, it seems that the problems with evaluating risk behaviors may be overcome through relying on the results of the present research.

In previous studies, risk perception has been measured from various perspectives, including single item likelihood assessments^{30,49} and measures of the worries or feelings of vulnerability.^{50,51} However, in the present study, risk perception was taken as one's understanding and feeling of the dangers of AIDS. The results of the present study showed that the highest weight factor in the AIDS health literacy questionnaire belonged to the second item (the perception of educational contents on AIDS prevention is straightforward), and this item had the most correlation with the total score of the questionnaire, an indication that comprehension of educational materials plays a vital role, a confirmation of the claim that educating incomprehensible contents to the audience is futile, and to prevent AIDS, this matter should be treated with utmost attention. As for the self-efficacy to control risk behavior questionnaire, the highest weight factor and correlation with the total score of the questionnaire belonged to the fifth item ("can you ensure you can sustain healthy sexual contacts forever?"). As for controlling risk behavior questionnaire, the highest weight factor belonged to the twelfth item (have you ever had sex with unprincipled people (prostitutes, call girls, etc.)). This finding stresses the importance of unsafe sex in AIDS, whereas the results indicate that HIV transmission through sexual contacts has been on the rise in Iran in recent years.⁵²

As for AIDS risk perception questionnaire, the highest weight factor and correlation with the total score of the questionnaire belonged to the fifth item ("AIDS should be taken seriously"), indicating the significance of one's perception of AIDS. It is noteworthy that controlling the risk behaviors associated with the AIDS questionnaire was developed through taking into consideration the fact that the main reported causes of HIV transmission were behaviors such as unprotected sex, intravenous drug injection, tattooing, and lack of hygiene in dentistry.¹³⁻¹⁵ Therefore, in this questionnaire, such items as the level of control in drug consumption, controlling high-risk sexual contacts, and controlling other risk behaviors associated with AIDS, such as going to the dental clinics are measured, and finally a general question is asked (how much control do you think you have over risk behaviors?).

The results of the present study demonstrated that there was a relationship between AIDS health literacy and risk behavior control, indicating that with the increase of AIDS health literacy, risk behaviors will be more controlled. In addition, the results showed that there was a relationship between AIDS health literacy and AIDS risk perception, indicating that with the increase of AIDS health literacy, the dangers of such behaviors will be more perceived.

To further explain this section, it might be safe to say that the ones with low health literacy are less likely to comprehend the written and oral instructions provided by health professionals, and thus generally fail to thoroughly follow the instructions.⁵³ Moreover, the relationship between self-efficacy and preventive behaviors against AIDS has been proved by researchers, and it can play an efficacious role in the reduction of risky behaviors leading to HIV²¹⁻²³ in that one is capable of changing one's behavior. In Albert Bandura's opinion,⁵⁴ self-efficacy is seen as an important factor that changes behavior, and according to the social-cognitive theory, self-efficacy beliefs are one of the major factors in changing behavior.¹⁷

In another section, the results of the study showed that there was a positive relationship between risk perception of AIDS and controlling risk behaviors. In other words, higher risk perception will lead to higher control over risk behaviors. The results of different studies indicate that poor risk perception regarding AIDS will lead to risky sexual behaviors.²⁶⁻²⁸ hence, the results of the current study are consistent with the findings of previous studies. When we say risk perception, we mean how much a person understands the risk and threat of AIDS; how much they feel the presence of the danger of AIDS.

According to the results, it can be said that the higher this understanding, the harder one will try to control their behavior, such as intravenous drug injection, or unprotected sexual behavior. This research has been conducted only in one area of Iran; therefore, one should be cautious with the generalization of results. If the questionnaires are used in other cultures, it is necessary that re-standardization be undertaken. The literature⁵⁵ emphasizes that variables such as self-efficacy and health literacy should be taken into account in order to prevent the transmission of HIV/AIDS and to control risky behaviors. The results of this study will be helpful in assessing and measuring these variables.

Conclusion

According to the results of the present study, it was concluded that all four AIDS-related questionnaires, that is to say, AIDS health literacy, self-efficacy in controlling risk behavior, AIDS risk perception, and controlling risk behaviors associated with AIDS, were appropriately valid and reliable and could be used in future studies by researchers, psychologists, psychiatrists and those who conduct studies on risk behaviors. It must also be mentioned that these instruments were designed in Iran, and their validity and reliability should be retested proportional to the population under study..

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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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