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Development and Psychometrics of Health Belief Model Instrument about HIV/AIDS

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Abstract

***Background*:** With no effective vaccine for prevention or a definite cure for treatment, health education is considered the most effective intervention against HIV. Using a valid tool to evaluate the effect of health education interventions is an inevitable necessity. The aim of this study was to design a tool and to assess its validity and reliability based on native culture characterization in order to evaluate the health belief model constructs about AIDS.

***Materials and Methods*:** 480 women covered by health bases of the city of Zanjan, in the age group of 20-30 years, married, and with at least first middle school education participated in this cross-sectional study. After reviewing the literature, the tool was designed and its validity and reliability was approved based on psychometric processes and feedback from the target group and a panel of experts through calculating the content validity ratio, content validity index, exploratory factor analysis, and determining internal consistency.

***Results*:** The validity of 37 items were assessed and selected through calculating the index score of the item effect above 1.5, content validity index ratio greater than 0.49, and content validity index higher than 0.79 and by using exploratory factor analysis with a special value greater than 1; seven factors and 34 items were kept and classified into five categories based on literature review and content items. The reliability of the research tool was calculated with Cronbach's alpha equal to 0.82.

***Conclusion*:** The results of this study provide appropriate evidence about the strength of structural factors and the reliability of the assessment tool for structures of health belief models about AIDS, and the creation of accessibility to a reliable tool for assessing the structures of health belief model.

Introduction

It is expected to obtain extensive information about the validity and reliability of the designed tool through studying the development process of the scale [1]. Some authors have repeatedly reported evidence of such a process, while some others have not. The measurement and report of the validity of the research tool is of essential importance [2]. The designer of a new scale must provide evidence for the validity of the tool [3] to ensure its credibility to researchers. In scientific publications, among the three topics of validity, reliability, and generalize ability, validity is considered as the most important, providing the basis of scientific research [4]. It is emphasized that an invalid research tool lacks effective application [5]. Validity is described as the credit and accuracy of the study. Bailey has regarded a study as valid when the researcher properly proposes his/her idea [6]. The validity of the research tool implies the deduction of truth from a set of sentences [7] and shows how explainable the results of the study are [8].

In research methodology, the validity of the research tool is a basic necessity [9] and is attainable through four methods of face validity, content validity, construct validity, and criterion validity [10]. Face validity deals with the assessment of the apparent validity, relevance, attraction, the logical sequence of dictions, as well as the briefness and comprehensiveness of the tool. In addition, it shows the realization accordance of lay people with the viewpoint of the researcher, the admissibility of the tool components and its totality.

Content validity is a process used at the beginning of the study [10]; it is related with the items adequacy of the research tool to assess the implications of the study [8], as well as the description and interpretation of the results obtained from the designed tool through a critical analysis of the tool's items to evaluate the clarity of meaning, adequacy of the number and continuity of items of the tool [9].

Content validity indicates the suitability of the measurement scale to provide a good sample of the items, present the desired structure and appropriate expression of the desired content dimensions, contain the main aspects of the measure, as well as the measurement of the exact thing that should be measured, and the partial and total acceptability of the tool from experts' viewpoints [11, 12].

Therefore, the evaluation of content validity is a key step in enhancing the credibility of the research tool, and a major issue for researchers who need high quality tools [13].

Burns and Grove stated that content validity can be accessed through literature review, choosing a proper sample of the target population, and the judgment of experts [14]. The most common quantitative method for the identification of content validity of multi-item scales is the content validity index based on the items relationship level score given by the experts [15].

The rapid growth of AIDS in the region and Iran has concerned experts, and educational interventions are widely used to confront it [16, 17]. The health belief model is the most known model for prevention-oriented program design, including HIV/AIDS, and its structures are: perceived susceptibility, severity, benefits, barriers, and self-efficacy [18]. The assessment of educational interventions requires the application of a valid tool which should be relevant with cultural characteristics; the purpose of this study was to design such a tool, and to assess its validity and reliability based on native culture characterization in order to evaluate the health belief model constructs about HIV/AIDS.

Materials and Methods

In this cross-sectional study, the design and assessment of the validity and reliability of the data collection tool were analyzed in relation to AIDS based on the health belief model. The study population consisted of women covered by the health bases of the city of Zanjan. Reliable sources and literature on the sample size for factor analysis suggest the ratio of appropriate variables to subject to be 1 to 5 or 1 to 10 [19].

According to the initial number of tool items (48 items), the appropriate sample size was estimated to be at least 240 up to 480 people. The total number of health bases of Zanjan during this study was 11, which were covered by six urban health centers. Taking geographical distribution, the distance between health centers and health bases, as well as demographic, economic, and social characteristics of population covered by the mentioned bases into consideration, 5 bases were selected. With the collaboration of health educators, 40 active health liaisons interested in participating in the study were selected from the list of health liaisons from five health bases. They were in the 20-40 age group, married, with at least first middle school education, and were enrolled in the study having been informed and given written consent. Subsequently, based on the determined sample size, health liaisons were asked to choose 12 women from covered family files. Study inclusion criteria were: being 20-30 years of age, married, non-pregnant, having no children under one year, having at least a fifth grade school education. Thus, according to the number of health liaisons participating in the study, 480 eligible women were selected and enrolled in the study. The main structures forming the health belief model are: perceived susceptibility (one's belief about the possible risk of a specific situation related to the health), perceived severity (the belief of the person about the severity and seriousness of the illness and its outcomes), perceived benefits (extent of subjective belief about the positive effects of performing health behaviors on reducing risk and affecting intensity), perceived barriers (one's belief about the psychological and physical costs in achieving a recommended health behavior) and perceived self-efficacy (an individual's subjective perception of his ability to perform the appropriate behaviors related to prevention). The guide signs of action also were considered among the modulator factors influencing the mentioned perceptions [16]. Based on extensive literature review and a review of available questionnaires, a detailed list of items was prepared for the initial design of the tool; subsequently, similar or culturally inappropriate items were deleted and reduced to 48 items. As far as possible, when designing the tool, the principles of Persian writing and questionnaire design were considered. Questionnaires were completed by the studied women and were performed as self-executive.

The data were analyzed with SPSS-17 statistical software; the statistical tests and methods for data analysis were: the quantitative method of item impact (Impact Item Method), the face validity qualitative method, the content validity ratio (CVR), the content validity index (CVI), exploratory factor analysis, and the internal consistency test (calculated by Cronbach's alpha).

To observe ethical considerations in this study, permission was acquired from the Ethics Committee of Tarbiat Modares University; then, experts and educators of health liaisons were fully briefed. After obtaining their agreement, the objectives, importance, and necessity of research project performance were expressed to health liaisons participating in the study. Finally, the informed and voluntary consent forms were distributed among them and were signed. At the same time, it was emphasized that the questionnaires be completed unnamed and coded, and ensured that the questionnaires' information will remain confidential.

Results

Four hundred and eighty women covered by 5 health bases of the city of Zanjan participated in this study. Table 1 shows the frequency distribution of age groups, education, marital status, and employment of the studied women. The women's mean age was 25.40±2.82 years.

Most of them were at diploma education, married, and housewives. To determine the validity of the research tool, the following steps were performed:

Determining face validity and calculating the item impact score index: by focusing on the target group to assess the validity of the tool, and to calculate the item impact index, at first a list of edited items was given to a group of 40 women of 20-30 years with similar demographic, economic, and social characteristics with target population. To calculate the mentioned index, five

options were placed in each item of the tool as: “very important, important, moderately important, somewhat important, and not important at all.” The scores of 5 to 1 were assigned respectively to them.

Table 1. Demographic characteristics (N=480)

Variables	N(%)
Age Groups	
20-22	85 (17.7)
23-25	154(32.1)
26-28	159(33.1)
29-30	82(17.1)
Mean/SD	25.40±2.82
Education	
Junior Secondary School	111(23.1)
Senior Secondary school	77(16.0)
Diploma	200(41.7)
Higher education	92(19.2)
Marital status	
Married	466(97.1)
Divorced/ Widow	14(2.9)
Job	
homemaker	364(75.8)
Student	66(13.8)
Employed	50(10.4)

Subsequently, the ratio of persons who had selected options 4 and 5 was determined, and the total scores allocated to each item, and the mean of scores of each one were calculated separately. The item impact index was calculated by multiplying the mean score of each item by the portion of people who had chosen the options 4 and 5, and those more than 1.5 were selected as appropriate items and retained for the next steps. To identify the face validity, items were also examined for comprehensibility, and social and cultural appropriateness from the viewpoint of the target group. Therefore, the number of questions related to perceived susceptibility, perceived severity, perceived benefits, perceived barriers, and perceived self-efficacy structures was decided to be 9, 8, 9, 13, and 9, respectively, for future analyses.

Calculating the content validity ratio: This index was calculated based on 15 experts' opinions in order to ensure that tool items had been designed in the best way to measure the content. The specialities of the panel experts were: health education (6 persons), epidemiology (1 person), infectious disease (1 person), psychiatry (2 persons), clinical psychology (2 persons), maternal and child health (1 person), biostatistics (1 person) and health services management (1 person).

This index has been developed by Lawsche [20], and the judgment of a panel of experts was obtained on every single item using the following spectrum: “item is necessary, item is useful but not necessary, item is not necessary.” After the tool items were judged by the panel of experts, they were collected again and the content validity ratio was calculated by means of the following formula:

$$CVR = \frac{\text{number of necessary answers of each item} - \frac{\text{total participants}}{2}}{\frac{\text{total participants}}{2}}$$

By referring to the Lawsche table, if the formula-calculated number for each item was greater than the numbers presented in Lawsche table (0.49 for 15 persons), this item was deemed necessary and important with an acceptable statistical significant level ($p< 0.05$) and was preserved for later analysis. Values calculated for majority of items were above 0.70 in this study.

Calculating the content validity index (CVI): The most prevalent quantitative method used by researchers to determine the content validity of multi-item scales is the content validity index, which is based on the relevance of the items regarding to the judgment of the panel of experts. This index shows whether the tool’s items were designed appropriately to measure the structures of the health belief model, or not. For this purpose, three criteria, including “simplicity and fluidity,” “relevance,” and “clarity or transparency” were used and calculated through Likert’s 4 partite spectrum [2, 14, 21]. Regarding the “simplicity and fluidity” criteria, the 4 partite Likert’s spectrum included: “1. the phrase is complex, 2. the phrase need some reforms, 3. the phrase is simple but requires revision, and 4. the phrase is very simple and fluent.” Regarding the “relevance” criteria, the 4 partite Likert’s spectrum included: “1. the phrase is irrelevant, 2. the phrase need some reforms, 3. the phrase is relevant but requires revision, and 4. the phrase is quite relevant and appropriate.” As for the “simplicity and fluidity” criteria, the 4 partite Likert’s spectrum included: “1. the phrase is obscure, 2. the phrase need some reforms, 3. the phrase is clear but requires revision, and 4. the phrase is quite clear and understandable.” The content validity index was calculated by using the following formula:

$$CVI = \frac{\text{total score accordant with each item ranking 3 and 4}}{\text{total answers number}}$$

The acceptance of each item was based on the following criteria: the content validity index score of 0.79 (acceptable), between 0.70 to 0.79 (questionable) and needed repair, and less than 0.70 (unacceptable) and should be removed from the item list [2, 24, 21]. After the calculation of the content validity ratio and index, the total number of accepted items for structures model was 37, as follows: 5 items for perceived susceptibility, 6 items for perceived severity, 7 items for perceived benefits, 11 items for perceived barriers, and 9 items for perceived self-efficacy.

Quality assessment of the content validity by experts: to determine the content validity through qualitative method in terms of Persian grammar observation, use of proper words, location of items in the right place, appropriate rating, time length required to complete the designed tool by participants, and appropriateness of the selected dimensions, the members of the panel of experts were asked to read each item and write their correctional comments comprehensively so that the necessary revisions could be performed based on them.

Factor Analysis: Factor analysis is one of the most reliable methods for determining the validity of construct, especially in tools that measure psychological specifications [22]; it tries to identify the essential

variables or factors to explain the pattern of correlations between observed variables. In this study, exploratory factor analysis was used to classify the variables which had internal correlation. This type of factor analysis is often applied in the early stages of research tool design. Before running the principal component analysis, the appropriateness of the data for performance of factor analysis was assessed. A factor matrix should include relatively high correlation. Tabachnick and Fidell have shown that if none of correlations fails to reach 0.30, the use of factor analysis would be doubtful [19]. In this research, correlation values greater than 0.40 were used. Regarding the application of exploratory factor analysis in this study, the default method was set on principal components. The performance of exploratory factor analysis commands resulted to six outputs [23]. The following tables depict the first, third, and fifth outputs.

The first output (Table 2) shows the value of Kaiser-Meyer-Olkin (KMO) index, the test value, and the degree of freedom and the significance level of the test. To perform an appropriate factor analysis, values 0.6 and higher are regarded as the conditions of factor analysis for the sampling adequacy test [19]. Since the (KMO) index value was equal to 0.845 (close to one), the selected sample size (480 patients) was thus adequate for factor analysis. The Bartlett sphericity test showed the suitability of the factor analysis to identify the structure factor model at a (p<0.0001) level, suggesting the existence of discoverable relationships between variables factor analyzed.

The second output shows the initial communality and the extraction communality. The communality of a variable is equal to the square of multiple correlations (R2) for the relevant variables through using factors (as predictors). Since the columns of the initial communality express the communality before factor(s) extraction, all initial communalities will be equal to one. The larger the extraction communality amount of the extracted factors, the better the variables will be showed. If any of the extraction communality amounts are very small, the extraction of another factor may be required. The calculated amounts of extraction communality in this study were generally between 0.49 and 0.72.

The third output (table 3) contained three parts: the first part (initial eigen values) was related to eigen values and determined the factors remaining in factor analysis (factors with eigen values less than 1 were excluded from the analysis).

Table 2. Kaiser-Meyer-Olkin and Bartlett's Test

Kaiser-Meyer-Olkin Measures of Sampling Adequacy (KMO)	0.845
Bartlett's Test of Sphericity	6341.169
df	595
Sig.	0.0001

The factors excluded from the analysis are those whose presence does not further explain the variance. The second part (the extraction sums of squared loadings) is related to the eigenvalues of unrotated extracted factors, and the third part (the rotation sums of loadings) represents the eigenvalues of the rotated extracted factors. In this study, regarding eigenvalues greater than 1 as the baseline and the slope of scree plot (Fig. 1), factors 1 to 7 with the ability to explain about 61% of the variance of variables remained in the analysis.

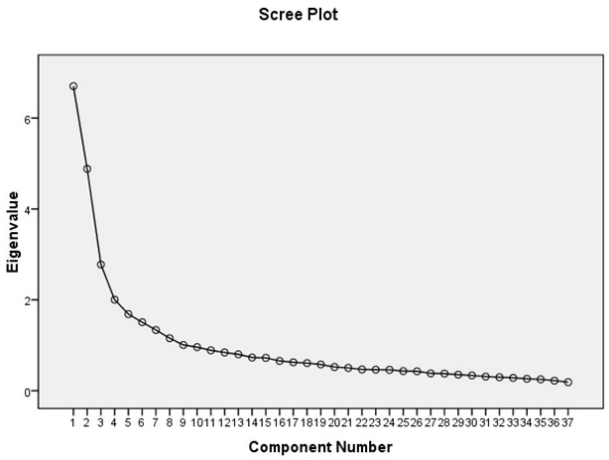

Figure 1. Scree Plot

The fourth output of the components matrix showed that it included the factor loadings (factor scores) in each of the remaining variables. Considering the fact that the interpretation of factor loadings without rotation is not easy, the rotation of factors will increase their interpretational capability. The fifth output (Table 4) showed the rotated components matrix including the factor loadings of each variable in the remaining factors after rotation. The higher the absolute values of these coefficients, the further the relevant factor will contribute to the total variance of the concerned variable. Regarding the factor analysis of 37 items and the subsequent deletion of three items (34, 35, and 36) thirty-four items were created including 5 main factors: perceived susceptibility (items 1 to 5), perceived severity (items 6 to 11), perceived benefits (items 12 to 17), perceived barriers (items 18 to 28), and perceived self-efficacy (items 29 to 33 and 37). Furthermore, the perceived barriers factor also had two other major subscales that were put in the same group in the designed tool considering the proximity of the coefficients of two items of the seventh factor with the fifth and sixth factors and their content.

Finally, despite having correlation values higher than 0.70, and being located in two separate factors, items 34 to 36 were eliminated from the question list of the questionnaire to avoid an excessive number of factors.

Determining the reliability of the data collection tool: The most common method of measuring the reliability of research tools is the Cronbach's alpha coefficient method based on the internal consistency (internal homology) of the scales within the questionnaire.

Therefore, the calculated Cronbach's alpha values for the entire structure of the health belief model was 0.82; for each model structure, it was as follows: 0.84 for perceived susceptibility structure, 0.81 for perceived severity structure, 0.86 for perceived benefits structure,

0.82 perceived barriers structure, and 0.76 for perceived self-efficacy structure. Since the calculated Cronbach's alpha values for each of the studied dimensions and constructs was greater than 0.7 in this research, the reliability of the tool was assessed to be good and confirmed.

Table 3. Total variance explained

Component	Initial Eigen values			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
	Total	% of Variance	Cumulative (Percent)	Total	% of Variance	Cumulative (Percent)	Total	% of Variance	Cumulative (Percent)
1	6.020	19.419	19.419	6.020	19.419	19.419	3.730	12.033	12.033
2	4.238	13.671	33.090	4.238	13.671	33.090	3.244	10.464	22.496
3	2.555	8.242	41.332	2.555	8.242	41.332	3.067	9.895	32.391
4	1.865	6.017	47.349	1.865	6.017	47.349	2.474	7.981	40.372
5	1.684	5.432	52.780	1.684	5.432	52.780	2.465	7.952	48.324
6	1.457	4.701	57.481	1.457	4.701	57.481	2.236	7.213	55.538
7	1.005	3.241	60.722	1.005	3.241	60.722	1.607	5.185	60.722

Table 4. Factor analysis of the Health belief Model Questionnaire about HIV/AIDS

Number of items	Constructs of Health Belief Model	Rotated component matrix						
		Factor 1	factor 2	Factor 3	Factor 4	Factor 5	Factor 6	Factor 7
1	Sensitivity 1	0.049	0.076	0.077	0.750	0.047	0.030	0.091
2	Sensitivity 2	0.002	0.070	0.076	0.822	0.007	0.013	0.053
3	Sensitivity 3	0.096	-0.017	0.082	0.802	0.085	-0.051	0.046
4	Sensitivity 4	-0.019	-0.027	0.036	0.769	0.114	0.087	0.052
5	Sensitivity 5	0.178	0.107	0.023	0.677	0.132	-0.005	-0.248
6	Severity 1	0.098	0.082	0.738	0.012	-0.038	-0.065	0.313
7	Severity 2	0.009	0.082	0.737	0.040	0.041	-0.049	0.306
8	Severity 3	0.086	0.063	0.693	0.072	0.083	0.131	0.116
9	Severity 4	0.153	0.053	0.758	0.102	0.149	0.027	-0.109
10	Severity 5	0.046	0.051	0.580	0.068	0.151	0.235	-0.296
11	Severity 6	0.328	0.140	0.607	0.090	0.034	0.051	-0.261
12	Benefit 1	0.774	0.138	0.125	0.088	-0.011	-0.133	0.119
13	Benefit 2	0.773	0.194	0.045	0.078	-0.009	-0.147	0.103
14	Benefit 3	0.694	0.250	0.090	0.095	-0.061	-0.075	-0.043
15	Benefit 4	0.761	0.056	0.084	-0.010	-0.027	-0.011	0.026
16	Benefit 5	0.687	0.111	0.070	0.085	-0.245	0.024	0.041
17	Benefit 6	0.703	0.183	0.142	-0.021	-0.052	0.006	-0.203
18	Barrier 1	-0.079	-0.044	0.069	0.001	0.135	0.682	0.043
19	Barrier 2	-0.107	-0.164	-0.008	0.001	0.166	0.775	-0.006
20	Barrier 3	-0.069	-0.067	0.128	0.035	0.192	0.726	0.135
21	Barrier 4	0.031	0.015	0.175	0.112	0.376	0.402	0.404
22	Barrier 5	0.097	-0.024	0.151	0.064	0.388	0.237	0.460
23	Barrier 6	0.091	-0.090	0.155	0.059	0.455	0.258	0.452
24	Barrier 7	-0.053	-0.061	0.057	0.120	0.643	0.216	0.055
25	Barrier 8	-0.145	-0.103	0.091	0.055	0.772	-0.005	0.070
26	Barrier 9	-0.089	-0.087	0.029	0.094	0.735	0.113	0.022
27	Barrier 10	-0.008	-0.097	0.141	-0.003	0.660	0.035	-0.088
28	Barrier 11	-0.118	0.114	-0.098	0.108	0.452	0.213	0.156
29	Selfefficacy 1	0.273	0.517	0.149	-0.007	0.017	-0.327	0.143
30	Selfefficacy 2	0.334	0.633	0.093	0.074	0.052	-0.197	0.117
31	Selfefficacy 3	0.139	0.765	0.042	0.056	-0.083	-0.042	-0.115
32	Selfefficacy 4	0.081	0.766	0.021	0.033	-0.153	0.047	0.031
33	Selfefficacy 5	0.128	0.767	0.109	-0.005	-0.181	0.036	0.054
37	Selfefficacy 9	0.208	0.684	0.081	0.085	0.071	-0.139	-0.220

Discussion

The results of the study showed that the designed tool possessed the appropriate validity and reliability to assess the main constructs of the health belief model about AIDS. Based on the findings of this research, it seems that the content validity of the studied tool, which was evaluated by a 15-member panel of experts and based on exploratory factor analysis, has a high level. Cronbach's alpha values calculated for each of the main constructs of the health belief model were in the range of 0.76 to 0.86, an acceptable reliability for the designed tool.

Validity is considered to be the basis for publishing the research findings, either during study design or during measurement process. If the validity of the tool is doubtful, the interpretation of the data in a study would be impossible. Validity is a problem that should be clearly mentioned when designing and publishing research findings. It seems that despite the attention of many researchers to the methodology of the research or data analysis, they show less attention toward the validity of the research tool and often rely on the validity of previous studies. When publishing research findings, merely stating general terms that "the validity of the research tool was confirmed by the proposals of some experts or the comments of the experts panel, or based on reviews" without mentioning the details of the used method is unacceptable and lacking in appropriate validity [2].

A very reliable tool for a particular population or position may not necessarily be valid for another population or position, because research tools are often designed for a specific group or a certain target [22]. Although this can partly be justified, it should be clear, firstly, whether the tool validity was correctly assessed in previous studies or not, and secondly, how much this tool could also be valid in the new position [2]. A relatively common feature of all studies that evaluate the health knowledge, attitude, and beliefs about AIDS is the researcher's note on using a valid and reliable tool. However, in most studies in Iran, the researcher has either used a translated questionnaire or attempted to design the tool; usually, clear and comprehensive information was not provided about the tool's validity determination process. Although this objection is less posed about the reliability of the tool, the main condition for the tool's reliability is its enjoyment of an appropriate validity. To assess the impact of AIDS education based on the health belief model, Karimi used a researcher-made questionnaire. In his study, the researcher pointed out the determination of validity and reliability through content validity and test-retest methods and by providing correlation coefficient values and Cronbach's alpha, he informed the reader about the reliability of the tool, but lack of information about the validity determination method and lack of use of exploration factor analysis draw attention [24].

In Rahmati's study on applying the health belief model for planning HIV prevention in students, she mentioned the inappropriateness of foreign tools with the cultural and moral characteristics of Iran, and the necessity of using a researcher-made questionnaire. In this study also, despite providing clear information about the determination of tool reliability, the mode of determining tool validity relied only on the use of qualitative methods for face and content validity and the use of a panel of experts (without mentioning the details of the psychometric process used and the factor analysis results) [25]. The study conducted by Ghaffari et al. in order to design and evaluate the validity and reliability of the measuring tool for structures of the health belief model about AIDS is probably among the few studies that have been conducted in Iran. The main objective of this study was to assess validity and reliability through the use of scientific and systematic approach; however, factor analysis was not performed regarding the tool's validity, and face and content validity was determined only based on the views of the panel of experts, without any details about the method. Hence, regarding the reliability of the tool, such an objection would not draw attention [26]. Zagumny and Brady studied the design of a tool to assess the health belief model, i.e. perceived susceptibility and severity and perceived benefits and barriers. The primary tool in this study was designed with 16 items and the results showed that the tool's items had a significant correlation with each other and Cronbach's alpha of structures were between 0.82 and 0.93.

The factor analysis result also showed that the four constructs of the tool can predict 64% of variations [27]. Despite the assessment of only four main constructs of health belief model in Zagumny and Brady's study, it was generally very similar to the results of the present study in which all five constructs were evaluated. To determine the scale validity of the health belief about AIDS, Scandell and Wlazelek performed their study based on the tool designed by Zagumny and Brady. The results of this study conducted on 189 students showed good validity but poor reliability and poor predictive power of sexual risk behaviors of the tool [28]. In a cross-sectional study on 425 Malaysian female teachers, Parsa et al. assessed the validity and reliability of the Malay language-translated tool with 63 items to evaluate the health belief model construct about breast cancer screening. Factor analysis confirmed 10 factors associated with self-efficacy, susceptibility and severity, benefits and barriers, and health incentive had eigenvalues larger than 1. Although the researcher mentioned the use of a panel of experts and provided no relevant information whether the impact item and the content validity ratio and index were calculated or not, this article offered accurate and complete information about the factor analysis and the reliability of the research tool, and is hence similar to the present study [29].

The reader will be able to understand the process of content validity assessment through documents provided relevant to the content validity of the tool used in the research. Content validity determination is associated with the accuracy and the comprehensiveness of the interpretation of the research findings. The validity determination process offers several choices to the

researcher. The research team should select the most appropriate approach for study design, items and data collection process. However, it is important to note that in the field of humanities, the design or assessment of an instrument of full validity is virtually impossible. The same fact also applies to the reliability of the measuring tool [4].

In this study, we tried to determine the validity of the research tool as far as possible based on psychometric processes and assigning the relevant details to provide appropriate evidence to be ensured about the validity of the tool. However, the research tool designed to assess the health belief model constructs about AIDS in women aged 20 to 30 years of the city of Zanjan is not necessarily free from error. The difficulty of designing items related with AIDS in a general target (not in a high risk) population, high volume and sample dispersion, and extent of studied geographic area are the limitations of this study. Furthermore, it seems that appropriate and optimal justification of health liaisons and health bases educators, understanding the importance and necessity of the AIDS issue for studied society, and the responsibility of the target group were effective in the optimal performance of the study. Making tools for assessing constructs of health belief model has been rarely studied in the general population of Iran, and this issue emphasizes the necessity to repeat similar studies. The results of this study provided good evidence about the strength of factor structure and acceptable reliability of the measuring tool of the health belief model about AIDS in the studied population. According to researchers, the results of this study provide an acceptable and appropriate basis for developing and repeating similar studies in order to achieve a tool with acceptable validity and reliability and based on indigenous culture and at a national level.

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Authors' Contributions

All authors had equal role in design, work, statistical analysis and manuscript writing.

Conflict of Interest

The authors declare no conflict of interest.

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