Designing and Developing the Prenatal Care Scale based on Health Belief Model

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Abstract

Aim: The aim of this study was to design a tool and to assess its validity and reliability based on native culture characterization to evaluate the health belief model (HBF) constructs about prenatal care.

Methods: 215 pregnant women covered by the health centers of Iranshahr in the age group of 18-35 years and the least ability of reading and writing participated in this cross-sectional study. After reviewing the literature, the tool was designed, and its validity and reliability were approved based on psychometric data of the target group and the view of a panel of experts through calculating the content validity ratio, content validity index, exploratory factor analysis, and internal consistency.

Findings: The validity of 42 items was assessed through calculating the index score of the item effect above 1.5, content validity ratio more than 0.80, and content validity index higher than 0.79. By using exploratory factor analysis with a special value greater than 1, six factors and 35 items remained that were classified into six categories based on the literature review and content items, which were able to predict 77.095 % of the total variance of the tool. The reliability of the research tool was calculated using Cronbach's alpha equal to 0.816.

Conclusion: The results of this study provide proper evidence about the strength of structural factors and the reliability of the assessment tool for the structures of HBM about prenatal care. It can be considered by the researchers in developing a tool for research, education and action.

Keywords: Prenatal care, Psychometrics, Validation

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Introduction

Pregnancy is one of the natural events during the childbearing age of every woman [1]. Prenatal care could reduce the risk of death and complications of pregnancy and childbirth [2]. Lack of enough care during pregnancy creates problems for the health of pregnant women, and may lead to adverse effects on the baby, including abortion, stillbirth, premature birth, and low birth weight [3]. These problems may also affect the health of their childhood. For having a healthy baby, women need a range of care measures that ensure the health of themselves and their child. This care begins from mother, her family and her home [4]. In health education, using educational models that are designed to discover the factors associated with behavior and evaluating the impact of these variables on the adoption of preventive behaviors [5] helps the researchers to find the proper strategies to promote behavior in pregnant women. In this context, Health Belief Model (HBM) is one of the most common theoretical frameworks used for behavioral change, which can be used as a basis for health education interventions. According to this model, behavior depends on the expected effects of an action [6]. This model has 6 structures: perceived susceptibility, perceived severity, perceived benefits, perceived barriers, self-efficacy, and cues to action. Based on the constructs of this model, healthy behaviors are a result of perception sensitivity and severity of the problem, perception of the benefits of behavior needed to avoid or manage the problem, facing stimulants promoting action, and the individual's insurance of the capacity and ability to do the behavior successfully [7, 8]. Several researchers have used the elements of this model successfully to describe the prophylactic treatment of diseases, healthy behavior and referring to health centers to receive health services including screening for various diseases [9, 10]. These studies can lead to behavior change through eliminating the perceived barriers, helping to understand the value of perceived benefits over the perceived barriers, and creating susceptibility and perceived severity, as well as creating self-efficacy for doing the healthy behavior [11]. However, pregnant women probably will adopt these behaviors if they know the vulnerable and adverse pregnancy outcomes and their sensitivity to them. They will believe that prenatal care can be helpful in reducing the adverse outcomes and its benefits outweigh the costs or barriers to adoption of these activities. Using HBM for evaluation of educational interventions needs a valid tool, which is based on local culture that fits to the social values and demographic characteristics of the target population [12].

This article is part of an extensive research on teaching maternal care behaviors to young pregnant women. Educational intervention in this study is based on HBM that conforms to the constructs of the HBM introduced by the designers. In order to gather information and measure each of the variables in the model, the research group needed to have the appropriate tool. However, a tool with the characteristics proper to the target population in the country was not designed. Given that the health of the mother and fetus during pregnancy is rooted in the cultural, social and economic needs of each society [13], and because of the lack of valid instrument for measurement of factors affecting prenatal care [12], the present study was designed and carried out for a psychometric evaluation of prenatal care questionnaires.

Objectives

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 HBM constructs about prenatal care.

Materials and Methods

Participants

This cross-sectional study was conducted in 2016. The design and assessment of the validity and reliability of the data collection tool were done based on the HBM. The study population consisted of pregnant women covered by the health centers of Iranshahr City in Iran. The related literature on the sample size for factor analysis study suggests the ratio of proper variables to subject should be 1 to 5 or 1 to 10 [10]. According to the first number of tool items (42 items), the suitable sample size was estimated to be at least 210-420 people. The total number of health centers of Iranshahr was 5. With the collaboration of midwives, 215 pregnant women were selected from the list of Pregnancy Care Office from these health centers. They were in the 18-35 years old age group, and with at least the ability to read and write. The participants were enrolled in the study having been informed and given written consent. The inclusion criteria were: being 18-35 years old, being in the first trimester of pregnancy, having the ability to read and write, having prenatal care records, and first pregnancy. Thus, according to the number of health centers participating in the study, 215 eligible pregnant women were selected and enrolled in the study.

Materials

HBM questionnaire

The main structures forming the HBM are: perceived susceptibility (perceived susceptibility refers to subjective assessment of risk of developing a health problem), perceived severity (perceived severity refers to the subjective assessment of the severity of a health problem and its potential consequences), perceived benefits (health-related behaviors are influenced by the perceived benefits of taking action), perceived barriers (health-related behaviors are a function of perceived barriers to taking action), cues to action (the HBM posits that a cue (or trigger) is necessary for prompting engagement in health-promoting behaviors), and perceived self-efficacy (self-efficacy refers to an individual's perception of his or her competence to successfully perform a behavior) [14].

Based on an extensive literature review (Comprehensive Guide for Nutrition of Pregnant Women, published by the Ministry of Health in 2014), Food, Nutrition and Diet Therapy of Mahan [15], and a review of available questionnaires [12], a detailed list of items was prepared for the first design of the tool; subsequently, similar or culturally inappropriate items were deleted and reduced to 42 items. Ten experts were elected for validation of the questionnaire. They included 7 experts in health education and health promotion, two experts in maternal and child health, and one physician for maternal health programs. The principles of Persian writing and questionnaire design were considered when designing the tool. To see ethical considerations in this study, permission was acquired from the Ethics Committee of Tarbiat Modares University, and Iranshahr University of Medical Sciences; then the participants were provided with information on the goal of the study and how to complete the questionnaire. After getting informed written consent from the participants, the questionnaires were administered. Those who did not give consent were excluded from the study.

Data analysis

After data collection from the completed questionnaires, the obtained data were coded and entered into the computer. The data were analyzed with SPSS-18 statistical software; for measuring the tool’s physical fitness (difficulty level, disproportion, and ambiguity) face validity qualitative method was used, and for reducing and removing inappropriate items and discovering the importance of each item, the quantitative method of item impact was employed. In order to assess the content validity, content validity ratio (CVR) and content validity index (CVI) were used. The discovery of a class of variables having the greatest relationship with each other was done using exploratory factor analysis, and Cronbach's alpha was applied to assess the internal consistency (a scale of constructive inter-item correlation).

Results

Socio-demographic characteristics of the participants are listed in Table 1.

Table 1: Demographic characteristics of the participants

Variable	Classification	Number (%)
Age		22. 8±7.79
Educational level	Elementary	53(24.7%)
	Middle	42(19.5%)
	High school	77(35.5%)
	University education	43(20%)
Household's monthly income	<294$	123(57.2%)
	294-588$	90(41.9%)
	>588$	2(0.9%)
Woman's occupation	Housewife	203(94.4%)
	Employee	12(5.6%)
Insurance status	Have insurance	162(75.34%)
	Does not have insurance	53(25.65%)

Discovering face validity and calculating the items' impact score index

By focusing on the target group to assess the validity of the tool, and to calculate the items' impact index, first a list of edited items was given to a group of 35 pregnant women of 18-35 years old with similar demographic, economic, and social characteristics to the target population. To calculate the mentioned index, each item included five options as: "very important", "important", "moderately important", "somewhat important", and "not important at all", scoring from 1 to 5, respectively. Subsequently, the ratio of women who had selected choices 4 and 5 was determined, the total score allocated to each item was calculated, and the mean scores of each one were calculated separately. The items' 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 proper items and saved for the next steps. To identify the face validity, the items were examined for comprehensibility, as well as social and cultural appropriateness from the viewpoint of the target group. So, before the analysis, the number of questions related to susceptibility, severity, benefits and barriers, cues to action, and self-efficacy were 10, 9, 6, 6, 3 and 8, respectively.

Calculating the content validity ratio

This index was calculated based on the opinion of 10 experts to ensure that the tool items had been designed in the best way for measuring the content. The panel consisted of experts in health education (7 people), maternal and child health (2 people) and doctor responsible of maternal health program (1 people).

This index has been developed by Lawsche [16], and the view of the panel of experts was obtained on every single item as: "item is necessary", "item is useful but not necessary", and "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 the following formula:

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

By referring to the Lawsche table, if the formula-calculated number for each item was greater than the number presented in the Lawsche table (0.62 for 10 persons), this item was deemed necessary and important with an acceptable statistical significance level ($p < 0.05$) and was preserved for later analysis. The values calculated for the majority of items were above 0.88 in this study.

Calculating the content validity index (CVI)

The most prevalent quantitative method used by the researchers to discover the content validity of multi-item scales is the content validity index, which is based on the relevance of the items regarding the judgment of the panel of experts. This index shows whether the tool's items were designed properly to measure the structures of the HBM or not. Three criteria including "simplicity and fluidity," "relevance," and "clarity or transparency" were used and calculated through a 4-partite Likert's spectrum [2]. The content validity index was calculated by using the following formula:

CVI = total score accordant with each item ranking 3 and 4 / total answers number

Judgment on each item is made as follows: If the CVI is higher than 79 percent, the item will be appropriate. If it is between 70 and 79 percent, it needs revision. If it is less than 70 percent, it is eliminated [16]. After calculating the content validity ratio and index, the total number of accepted items for the model structures was 37 as follows: 8 items for perceived susceptibility, 8 items for perceived severity, 5 items for perceived benefits, 5 items for perceived barriers, 3 items for cues to action, and 8 items for perceived self-efficacy.

Quality assessment of the content validity by experts

To discover the content validity through qualitative method by Persian grammar observation, use of proper words, location of items in the right place, proper rating, time length needed to complete the designed tool by the 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 the necessary revisions could be performed based on them.

Factor analysis tries to identify the essential variables or factors to explain the pattern of correlations between the observed variables [17]. In this study, exploratory factor analysis was used to classify the variables, which had internal correlation. This analysis is often applied in the early stages of designing a research tool. Before running the principal component analysis, the appropriateness of the data for performance of factor analysis was assessed. A factor matrix should include rather high correlation. Kaiser has shown that if none of the correlations fails to reach 0.30, the use of factor analysis would be doubtful [18]. In this research, correlation values greater than 0.35 were used. On the application of exploratory factor analysis in this study, the default method was set on principal components. The exploratory factor analysis resulted to six outputs [17]. Important findings were as follows:

The first output (Table 2) shows the value of Kaiser-Meyer-Olkin (KMO) index, the test value, the degree of freedom, and the significance level of the test. To perform an appropriate factor analysis, values equal to 0.6 and higher are regarded as the conditions of factor analysis for the sampling adequacy test [10]. Since the KMO index value was equal to 0.836 (close to one), the selected sample size (215 patients) was thus adequate for factor analysis. The Bartlett's sphericity test showed the fitness of the factor analysis to identify the structure factor model at a $p<0.001$ level, suggesting the existence of discoverable relationships between the variables analyzed.

Table 2: KMO and Bartlett's test to assess the adequacy of the sample size in exploratory factor analysis about prenatal care based on health belief model (HBM)

Kaiser-Meyer-Olkin measures of sampling adequacy (KMO)	0.836
Bartlett's test of sphericity	7901.36
df	595
P	0.001

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 shown. If any of the extraction communality amounts is small, the extract of another factor may be required. The calculated amounts of extraction communality in this study were between 0.535 and 0.932.

The third output (Table 3) contains three parts:

the first part was related to the initial Eigen values and determined the factors remaining in the factor analysis (factors with Eigen values less than 1 were excluded from the analysis).

Table 3: Total variance explained

	Total			Variance			Explained		
Component		Initial Eigen values		Extraction	Sums of	Squared loadings	Rotation	Sums of	Squared loadings
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	12.757	36.450	36.450	12.757	36.450	36.450	6.887	19.678	19.678
2	5.165	14.757	51.207	5.165	14.757	51.207	6.085	17.384	37.062
3	2.975	8.500	59.707	2.975	8.500	59.707	5.938	16.977	54.029
4	2.906	8.302	68.009	2.906	8.302	68.009	3.858	11.022	65.051
5	1.973	5.637	73.646	1.973	5.637	73.646	2.945	8.415	73.466
6	1.207	3.449	77.095	1.207	3.449	77.095	1.270	3.629	77.095

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 Eigen values of unrotated extracted factors, and the third part (the rotation sums of loadings) represents the Eigen values of the rotated extracted factors. In this study, the Eigen values greater than 1 as the baseline and the slope of scree plot (Fig. 1), and factors 1 to 6 with the ability to explain about 77% of the variance of variables remained in the analysis.

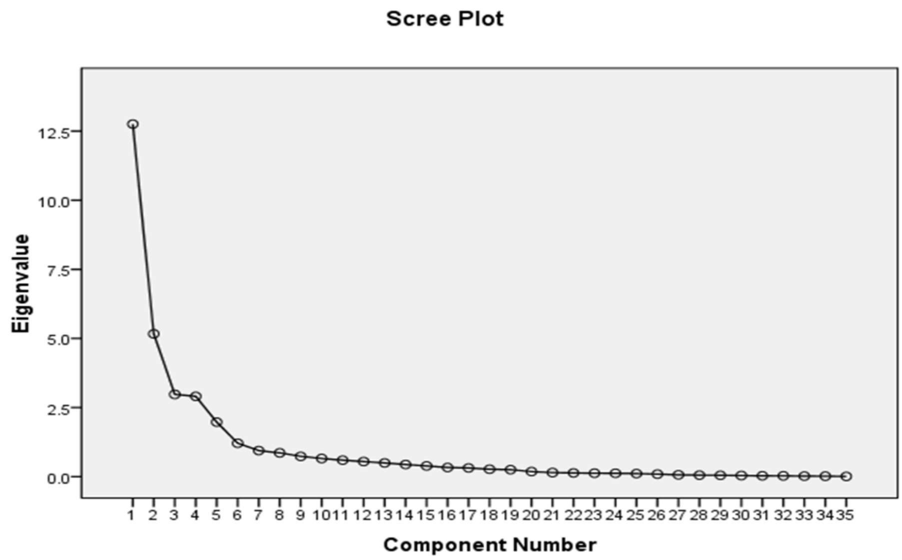

Figure 1: Scree plot.

Table 4: Factor analysis of the HBM questionnaire about prenatal care

Item	No	F1	F2	F3	F4	F5	F6
Perceived susceptibility							
If I do not do prenatal care, my fetus is at risk.	1	.716					
If I do not do prenatal care, my health is at risk.	2	.851					
If I don't eat iron, folic acid and multivitamins tablets, my health could be compromised.	3	.851					
If I don't eat iron, folic acid and multivitamins, my fetus's health may be compromised.	4	.814					
If I do not do prenatal care, my blood pressure and swelling may increase.	5	.785					
If I have no physical activity (walking 3 times a week for 30 minutes each time), I cannot control my weight at an optimal level.	6	.901					
Without observing the dietary rules, the materials needed for themselves and my fetal are not provided.	7	.881					
No tests during pregnancy may have a high risk for pregnancy.	8	.852					
Perceived severity							
Maternal death due to not doing prenatal care is very unfortunate.	1		.758				
Fetal death due to inadequate care during pregnancy is very hard.	2		.817				
Irregular use of iron tablets during pregnancy can cause postpartum mothers' death.	3		.826				
Ignoring the danger signs during pregnancy (blurred vision, headache, swelling, ...) can cause the death of the mother.	4		.803				
Failure to follow recipes of diet during pregnancy can cause death of the mother.	5		.839				
Failure to follow recipes of diet during pregnancy can cause abortions.	6		.679				
Not doing tests during pregnancy can cause death of the fetus.	7		.666				
If I do not have physical activity (walking 3 times a week for 30 minutes each time), I will have a difficult delivery.	8		.788				
Perceived benefits							
By doing regular prenatal care, maternal health is guaranteed.	1			.947			
By doing regular prenatal care, fetal health is guaranteed.	2			.922			
By observing the dietary rules during pregnancy, maternal health is provided.	3			.627			
With prenatal care, paying high costs for treatment of maternal and fetal problems can be avoided.	4			.636			
By doing physical activity (walking), I will have a more comfortable delivery.	5			.918			
Perceived barriers							
Prenatal care is expensive for me.	1				.774		
Going to the health center is difficult due to long distances.	2				.722		
May wife does not cooperate with me for prenatal care.	3				.735		
Prenatal testing is expensive for me.	4				.798		
It is hard for me communicating with the health personnel.	5				.701		
Self-efficacy							
I can do prenatal care, even if the health centers are far to my home.	1					.957	
If I have any of the symptoms of pregnancy (blurred vision, headache, swelling), I immediately go to the doctor or the nearest health center.	2					.911	
Despite the hard work at home, I can devote my time to do pregnancy tests.	3					.929	
Despite the difficulties, I can attend classes for prenatal care.	4					.886	
Despite the ridicule and harass by others, I can do physical activity (walking 3 times a week for 30 minutes each time).	5					.861	
Despite financial difficulties and much house chores, I do observe the dietary rules during pregnancy.	6					.904	
Despite gastrointestinal side effects of tablets (such as nausea), I can take iron, multivitamins and folic acid tablets regularly.	7					.911	
Cues to action							
To obtain information on prenatal care, how much help is provided by your doctor?	1						.804
How much existence of fetal death, premature infants, etc. in others affects you to do prenatal care?	2						.680

The fourth output of the components' matrix shows that it included the factor loadings (factor scores) in each of the remaining variables. Considering the fact the interpretation of factor loadings without rotation is not easy, the rotation of factors will increase their interpretational capacity. The fifth output (Table 4) shows the rotated components matrix, which include 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 two items (31and 37), 35 items were created including 6 main factors: perceived susceptibility (items 1 to 8), perceived severity (items 9 to 16), perceived benefits (items 17 to 21), perceived barriers (items 22 to 26), perceived self-efficacy (items 27 to 33), and cues to action (items 34 to35).

Discovering 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 HBM was 0.816; and for each model structure, it was as follows: 0.808 for perceived susceptibility structure, 0.809 for perceived severity structure, 0.81 for perceived benefits structure, 0.82 perceived barriers structure, 0.811 for perceived self-efficacy structure, and 0.79 for cues to action structure. Since the calculated Cronbach's alpha value 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.

Discussion

The results of this study provided by psychometric process showed the strength of the factorial structure and reliability of the instrument for measuring the HBM in prenatal care for the vulnerable group of pregnant women. In many studies, it seems that researchers have paid much attention to research method; however, less attention is paid to the validity and accuracy of the tool. Researchers often rely on the validity of the tools in previous studies [19]. Maybe a valid tool in a population or a particular location is not necessarily valid for others because often research tools are designed for a specific group or a specific target [20]. Although this can partly be justified, it must be determined whether the validity of questionnaires has been assured in the right way or not. Also it should be considered how much the tool can be valid in the new position [21]. To discover the scientific validity of this study, the designed tool was given to 10 experts. In most studies, less than 10 people are employed in a panel of experts to validate the research tool. For example, in a study with the aim of supplying the Chinese version of efficacy scale in the delivery, six experts were used for the content validity [20]. Of course, it seems reasonable that some issues may limit nature and scope. In the study of pregnant women's beliefs on prenatal care or other health problems, with large-scale socio-cultural, economic, psychological and behavioral dimensions, using a greater number of specialists and experts in various fields can be very helpful. As the study showed the importance of this issue, at the stage of validation, valuable and diverse points were collected, which represent the evaluation tool from different angles by the panel members. During the development of this scale, its validity was tested after removing the suitable items and selection of better items. Exploratory factor analysis was used to measure its reliability and validity. We used the Kaiser-Meyer-Olkin's (KMO) measurement of sampling adequacy and Bartlett's test of sphericity to discover whether the data were proper for factor analysis. The value of KMO measurement of sampling adequacy was 0.836, showing that the sample size is enough for principal component analysis. Similarly, the results gained from the Bartlett's test of sphericity ((x^2 = 7901.36, SD =595, p = 0.001) showed the variables are correlated, and therefore, suitable for factor analysis [21]. In principal component analysis, the model was examined on a structure with six items. Then five items were removed from the model because of their high loadings on different factors. It was determined that the structure with six factors consisting of 35 questions explained 77% of total variance, and the factor loading value was above 0.627 in all items of the factors included in the scale. These results show that validity of the scale is at an acceptable level [22]. Unlike the results of Tahmasebi study, the results of exploratory factor analysis in the present study showed that factor loading of the items was higher in this study, and that the range included all constructs of HBM; this is while in Tahmasebi study, the cues to action construct were not proposed [23].

The most widely used method for evaluating internal consistency is coefficient alpha (or Cronbach's alpha). The normal range of values is between 0.00 and 1.00, and higher values reflect a higher internal consistency [24]. In the present study, Cronbach's alpha coefficient value in all six factors of HBM ranged between 0.79 and 0.82, showing a high-level reliability [10]. Total item score correlations of HBM and alpha coefficients without items were calculated. Items with 0.35 and higher values of total item score correlation are considered as distinguishing items. Items with coefficient values lower than 0.35 are recommended to be excluded from the scale, discounting their statistical significance [24]. In this study, total item correlation values for all items were statistically significant showing that the scale items enjoy distinguishing properties and have consistency with one another [24, 25].

In this study, we tried to discover the validity of the research tool as far as possible based on psychometric parameters and assigning the relevant details to provide proper evidence to ensure about the validity of the tool. However, the research tool was designed to assess the HBM constructs about prenatal care in pregnancy. Making tools for assessing constructs of HBM has been rarely studied in the general population of Iran, and this issue stresses the need to repeat similar studies. The results of this study provided good evidence about the strength of factor and acceptable reliability of the measuring tool of the HBM about prenatal care in the studied population. The results will further provide an acceptable and proper basis for developing and repeating similar studies to achieve a tool with acceptable validity and reliability and based on indigenous culture and at a national level. One main Limitation of the study was that the questionnaire was carried out only in groups of mothers with first pregnancy, so this is not a representative sample of the general population of pregnant women. Because of lack of valid and reliable tools agreeing with the cultural, social and economic differences to measure maternal care behaviors and influencing it, this study can be useful in ensuring these objectives.

Acknowledgments

The authors thank Tarbiat Modares University for giving the financial support to undertake the study. We appreciate the valuable help of Dr. Fazlollah Ghofranipour, the panel of experts, and experts in the health centers of Iranshahr, as well as the pregnant women who took part in this study.

Footnotes

Authors' contribution**:** Hossien Izadirad developed the research idea, prepared the manuscript, and analyzed and interpreted the data. Shamsadin Niknami contributed to developing the design of the study and the questionnaire and carried out the statistical analyses and manuscript writing. Iraj Zaraban and Aliraza Hidarnia contributed to developing the idea for the project and interpreting the results.

Support

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References

1. Khorsandi MA, Ghofranipour F, Heidarnia A, Faghihzadeh SB, Ghobadzadeh M. The effect of PRECEDE PROCEED model combined with the health belief model and the theory of self-efficacy to increase normal delivery among nulliparous women. Procedia Soc Behav Sci 2012; 46: 187-94.
2. Liu CM, Chang SD, Cheng PJ. Relationship between prenatal care and maternal complications in women with preeclampsia: Implications for continuity and discontinuity of prenatal care. Am J Obstet Gynecol 2012; 51: 576-82.
3. Feijen-de Jong EI, Jansen DE, Baarveld F, Spelten E, Schellevis F, Reijneveld SA. Determinants of use of care provided by complementary and alternative health care practitioners to pregnant women in primary midwifery care: a prospective cohort study. BMC Pregnancy Childbirth 2015; 15(140): 1-11.
4. Trotman G, Chhatre G, Darolia R, Tefera E, Damle L, Gomez-Lobo V. The effect of centering pregnancy versus traditional prenatal care models on improved adolescent health behaviors in the perinatal period. J Pediatr Adolesc Gynecol 2015; 28: 395-401.
5. Beydoun HA, Beydoun MA. Predictors of colorectal cancer screening behaviors among average-risk older adults in the United States. CCC 2008; 19(4): 339-59.
6. Eccles JS, Wigfield A. Motivational beliefs, values, and goals. Annu Rev Psychol 2002; 53.
7. Buglar ME, White KM, Robinson NG. The role of self-efficacy in dental patients'brushing and flossing: Testing an extended Health Belief Model. Patient Educ Couns 2010; 78(2): 269-72.
8. Boon-Yuen NG, Atreyi K, Yunjie (Calvin) Xu. Studying users' computer security behavior: A health belief perspective. Decis Support Syst 2009; 46(4): 815-25.
9. Guvenc G, Akyuz A, Acikel CH. Health belief model scale for cervical cancer and pap smear test: psychometric testing. J Adv Nurs 2011; 67(2): 428-37.
10. Canturk C, Sebahat G. Development and validation of health beliefs model scale for prostate cancer screenings (HBM-PCS): Evidence from exploratory and confirmatory factor analyses. Eur J Oncol Nurs 2011; 15: 478-85.
11. Bylund CL, Galvin KM, Dunet DO, Reyes M. Using the Extended Health Belief Model to understand siblings' perceptions of risk for hereditary hemochromatosis. Patient Educ Couns 2011; 82(1): 36-41.
12. Shamsi M, Hidarnia A, Niknami Sh, Rafiee M. Development and psychometric assessment of an oral health instrument based on Health Belief Model in pregnant

women. AMUJ 2012; 15(65): 45-56.

13. Dako-Gyeke P, Aikins M, Aryeetey R, Mccough L, Baba Adongo P. The influence of socio-cultural interpretations of pregnancy threats on health-seeking behavior among pregnant women in urban Accra, Ghana. BMC Pregnancy Childbirth 2013; 13(211): 1-12.
14. Glanz K, Rimer BK, Viswanath K. Health behavior and health education: theory, research, and practice. 4th Edition, San Francisco, CA: Jossey-Bass; 2008; p: 45-51.
15. Mahan LK, Escott-stump S. Krause's, Food, Nutrition and Diet Therapy. 13th Edition, Philadelphia: WB Saunders Co; 2012; p: 340-71.
16. Nikki BZ, Lorraine SW. Development and validation of a Medicaid Postpartum Tubal Sterilization Knowledge Questionnaire. Contraception 2007; 76: 287-91.
17. Maja S, Pierre C, Dorcas EB, Eleanor B, David C. Structural and construct validity of the Whiplash Disability Questionnaire in adults with acute whiplash-associated disorders. Spine J 2015; 15: 2369-77.
18. Kaiser HF. A revised measure of sampling adequacy for factoranalytic data matrices. Educ Psychol Meas 1981; 41: 379-81.
19. Pirasteh A, Heydarnia A. Exploratory factor analysis of psychosocial determinants measures of physical activity among Iranian adolescent girls. MJIRI 2009; 26(4): 474-85.
20. Ip WY, Chan D, Chien WT. Chinese version of the Childbirth Self-efficacy Inventory. J Adv Nurs 2005; 51(6): 625-33.
21. Tavakol M, Dennick R. Making sense of Cronbach's alpha. Int J Med Educ 2011; 2: 53-5.
22. Soleymanian A, Niknami S, Hajizadeh E, Shojaeizadeh D, Montazeri A. Development and validation of a health belief model based instrument for measuring factors influencing exercise behaviors to prevent osteoporosis in pre-menopausal women (HOPE). BMC Musculoskelet Disord 2014; 1(15): 61.
23. Tahmasebi R, Noroozi A, Ghobadi Dashdebi K. Psychometric Evaluation of the Colorectal Cancer Screening Belief Scale Based on Health Belief Model's Constructs for the Fecal Occult Blood Test. Asian Pac J Cancer Prev 2016; 17(1): 225-9.
24. Polit DF, Beck CT. Nursing Research Principles and Methods. 7th Edition, Philadelphia: Lippincott Williams & Wilkins; 2003.
25. Asiye K, Suheyla AO. Validity and reliability study of the Turkish version of Health Belief Model Scale in diabetic patients. Int J Nurs Stud 2007; 44: 1447-58.