Original Article

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Psychometric Properties of Persian Version of Prenatal Health Behaviors

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ABSTRACT

BACKGROUND AND OBJECTIVE: Health behaviors, includes physical activity, nutrition, spiritual growth, responsibility, interpersonal relationships, and stress management. Since there is no specific tool for measuring the health behaviors of Iranian pregnant women, this study was conducted for the first time in the Iranian population in order to psychoanalyze the Persian scale of prenatal health behaviors scale.

METHODS: This cross-sectional psychometric study was performed on 200 pregnant women in Babol and Amol pregnancy clinics by available sampling method. During the pregnancy care visit, women with a gestational age of 14 weeks or more completed demographic questionnaires and pregnancy health behaviors with a score range of 0-48. Scale psychometrics were performed using Cronbach's alpha and internal consistency obtained from retesting, exploratory and confirmatory factor analysis and with Amos software.

FINDINGS: The mean health-promoting behaviors of pregnant women were 24.8±5.5 and destructive health behaviors were 23.7±14.2. The results of factor analysis showed that this scale in Iranian pregnant women has four domains of behavioral habits / destructive health nutrition, behavioral habits / health promoting nutrition, physical health promoting activities, destructive physical health habits with explained variance of 65.13%. Intra-cluster correlation index in all four areas of the questionnaire and also the total score of the test was above 0.9, which confirms the repeatability of this test.

CONCLUSION: According to the results of this study, the Persian scale of pregnancy health behaviors has a validity and reliability to assess the health and destructive behaviors of pregnant women in Iranian society and can be used in clinical and research situations.

KEY WORDS: *Health Behaviors, Pregnancy, Psychometrics, Validation Study, Iran.*

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Introduction

Health behaviors include physical activity, nutrition, spiritual growth, responsibility, interpersonal relationships, and stress management (1). From another perspective, pregnant women's health behaviors cover a range of healthy and unhealthy behaviors such as nutrition, exercise, smoking, and drug abuse (2, 3). Some pregnant women use the approach relative to health and some use destructive health behaviors (3, 4). Research shows that there is a relationship between healthy behaviors and favorable pregnancy outcomes (2). Some studies have shown that psychological factors change during pregnancy that may affect health behaviors and pregnancy outcomes (5-7).

The level of observance of pregnant women regarding healthy behaviors and avoiding harmful behaviors varies. Some reports indicate that pregnant women in terms of observance of healthy behavior promoting health are, in low to moderate state. In one study, the total score of health promoting behaviors was moderate. The highest scores were related to spiritual growth (self-actualization) and nutritional status and the lowest score was related to stress management and physical activity (10). In a study of Iranian women in term of non-smoking and smoking status were favorable (11). In other evidences, they have an average score and in terms of stress management and physical activity, their score is low (12-16).

During pregnancy, important physiological changes and mental states occur that are the source of changes in eating, activity and rest behaviors in women. As a result, measuring the health behaviors of pregnant women requires special tools. One of the problems of studies on prenatal health behaviors is evaluation of healthy behaviors in pregnant women by promoting health behavior questionnaire second Edition (HPLP-II) (8-15) which is a general tool for health behaviors (10, 17). The Prenatal Health Behavior Scale (PHBS) was first developed by Lobel et al. in 1995 (2) and has been psychoanalyzed in several languages. Auerbach and colleagues reported adequate PHBS validation to assess pregnancy health behaviors (18).

Given that in Iran there is no proper description of health-promoting behaviors of pregnant women with appropriate and specific pregnancy tools and various studies have used the general tool for measuring health behaviors, HPLP-II, the introduction of appropriate tools for measuring pregnancy health behaviors to use is necessary in the Iranian population. As a result, the aim of this study was to determine the validity and reliability and structural factors of the Persian version of the PHBS Pregnancy Health Behaviors Scale for the first time in Iran. The results of this study can be a suitable tool for measuring the health behaviors of Iranian pregnant women in clinical and research fields.

Methods

This cross-sectional study of instrumental psychometrics, after approval by the ethics committee of Babol University of Medical Sciences with the code MUBABOL.HRI.REC.1396.62, was performed on pregnant women referring to general pregnancy care clinics in Babol and Amol. Available sampling was performed from pregnant clients of two rural health centers of Babol, an urban health center of Amol and a university hospital of Babol. Samples were selected voluntarily by available sampling method. During the sampling period, pregnant clients who were eligible to study were 1300, which according to Morgan table, the sample size was 200.

Subjects older than 18 years, gestational age over 12 weeks and having satisfaction were included in the study. People under 18 years of age (pregnancy in adolescents) and people who had less than fifth grade education or for any reason could not read and answer the questionnaire questions themselves were excluded from the study. One midwife in each center checked the inclusion criteria in the referring women and obtained demographic information from eligible individuals when pregnant women came to receive prenatal visits. After explaining the purpose of the study and how to answer the questions, research questionnaires were given to them to complete.

Research tools: Data such as age, education, gestational age, occupation, place of residence and also the scale of pregnancy health behaviors were collected using the PHBS questionnaire. This questionnaire is a 24-item self-report tool that examines the health behaviors of pregnant women during the previous two weeks. This scale covers a range of health and non-health behaviors including nutrition, exercise, smoking and drug abuse. Respondents mark each item from zero (never) to 4 (often). The total score range is 0-48. After correspondence with the questionnaire designer and obtaining his permission, the translation was done forward-backward. At first, two translators fluent in translating English texts translated the English questionnaire into Persian. Then, two other translators fluent in both Persian and English were asked to

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translate the Persian version into English, then the two English translations obtained by the project executors were compared with the original English version. Finally, the final Persian version of the Pregnancy Health Behaviors Questionnaire was approved. After ensuring the accuracy of the transfer of concepts, in order to check the validity, a qualitative questionnaire was given to ten pregnant women who were eligible to enter the study, and they were asked to comment on the content, clarity, simplicity and easy to understand phrases and ease of completing the questionnaire qualitatively. Also, the content validity was done qualitatively, with the opinion of five experts in the field of fertility and health. Retrospective reliability study, about 30 low-risk pregnant women with a gestational age of more than 12 weeks, completed the PHBS questionnaire twice, two weeks after enrollment.

To evaluate the validity of PHBS, internal agreement was calculated by calculating Cronbach's alpha coefficient and reliability of retest method was used to determine internal consistency. In the next step, exploratory factor analysis and then confirmation were used to determine the areas of the Pregnancy Health Behavior Questionnaire. Exploratory factor analysis was performed with SPSS 24 software, confirmatory factor analysis was performed by Amos 86 software. To achieve model processing from goodness of fit indicators (GFI), chi-square index and corresponding degree of freedom, comparative or adaptive fit index (CFI), root mean square residual index (RMR) was used.

RMSEA index less than or equal to 6% indicates a good fit, between 6% to less than or equal to 8% indicates a moderate and acceptable fit, between 8% to less than or equal to 1 indicates average fit and greater than 1 indicates good fit of model's condition. A RMR less than or equal to 8% indicates a good fit. The correlation coefficient of health behaviors with quantitative variables such as age, education, gestational age with Pearson correlation statistical values and for qualitative variables the number of pregnancies and the number of abortions with Spearman statistics were calculated and $p<0.05$ was considered significant.

Results

The age range of pregnant women was 18 to 44 years (mean 27.49±5.34 years). 75 people (37.5%) were under 25 years old (Table 1). The mean health-promoting behaviors of pregnant women were 24.8±5.5 and destructive health behaviors were 23.7±14.2. The validity of the questionnaire with Cronbach's alpha of the whole instrument was 0.87. Also, Cronbach's alpha of the subcomponents was the tool of unhealthy eating behaviors (0.96), healthy eating behaviors (0.80), healthy physical activity behaviors (0.72) and unhealthy activity behaviors (0.53). In the reliability assessment, the correlation coefficient in the sub-categories of behavioral habits / destructive health nutrition was (0.93), behavioral habits / health-promoting nutrition was (0.97), promotional physical activity was (0.98), destructive health habits was (0.97). In addition, the correlation coefficient of all PHBS questions in two measurements was 0.96.

The results of exploratory analysis of the Persian version of PHBS are shown in Table 2. The KMO index of 0.87 indicates the adequacy of the data for factor analysis. Principal component analysis was extracted by Varimax method using four factors:

Factor 1) destructive behavior / nutrition habits (questions 5, 7, 9, 16, 19, 20, 21, 24)

Factor 2) Health-Promoting Behavior / Nutrition Habits (Questions 2, 3, 6, 10, 12, 18, 23)

Factor 3) Promotional Physical Activities (Questions 1, 11, 15)

Factor 4) Destructive physical habits of health (questions 4, 8, 13) and two questions numbers 14 and 17 were not loaded in any of the factors. These four factors explain 63.13% of the variance.

The results of confirmatory factor analysis of four factors of Persian version of PHBS based on the measurement model are shown in Figure 1. Fit indices of this model are good fit (CFI= 0.96), increasing fit (IFI= 0.96), root mean square error (RMSEA= 0.06), adjusted good fit index (AGFI= 0.83), comparative fitting of economics (PCFI= 0.82), normalized fitting of economics (PNFI= 0.78), indicates proper fit of data.

Table 3 shows the correlation between healthy and destructive behaviors and demographic variables in pregnant women. Health-promoting behaviors (total scores of health-promoting habits and nutrition-promoting behaviors and physical-promoting physical activity) were directly related to the number of pregnancies of pregnant women. Destructive health behaviors (sum of scores of subcomponents of habits and destructive eating behaviors and destructive health habits) had a significant negative relationship with women's education and gestational age ($p<0.05$).

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Table 1. Characteristics of the studied population

Variable	Number(%)
Age	
25≥	75(37.5)
25<	123(62.1)
Education	
Diploma and less	143(75.3)
More than a diploma	47(24.7)
Gestational age	
20≥	79(39.5)
20<	121(60.5)
Number of pregnancies	
The first time	79(40.1)
Second time	81(41.1)
Third and more	37(18.8)
Job	
Housewife	181(95.8)
Employed	8(4.2)

Table 2. Results of Exploratory Factor Analysis of Persian Version of Pregnancy Health Behaviors

	Question	Mean±SD	First factor*	Second factor*	Third factor*	Fourth factor*
How many times in the last two weeks have you had the following behaviors?						
5	Did you smoke?	0.06±0.38	0.97			
7	Did you eat a snack instead of a regular meal?	1.93±1.37	0.87			
9	Did you drink caffeinated things like coffee or cola?		0.96			
16	Did you drink alcohol, wine, beer or alcohol?	0.80±0.40	0.96			
19	Did you smoke marijuana?	0.07±0.33	0.95			
20	Did you eat more than you needed?	1.94±1.27	0.86			
21	Did you skip a meal such as breakfast or lunch?	1.88±1.48	0.80			
22	Did you use cocaine, crack, and other dangerous drugs?	0.05±0.27	0.71			
24	Have you used over-the-counter medications such as aspirin or lung syrup?	2.01±1.81	0.69			
2	Did you get enough sleep?	3.01±0.91		0.77		
3	Did you drink milk; eat dairy products (yogurt, cheese or supplements)?	3.16±0.17		0.74		
6	Did you take vitamins?	3.06±1.29		0.71		
10	Did you eat enough to satisfy your hunger?	3.02±1.07		0.62		
12	Did you eat high fiber foods such as whole grain breads or cereals?	2.53±1.09		0.71		
18	Did you drink enough?	3.06±1.00		0.60		
23	Did you eat a balanced meal, including fruits and vegetables?	3.02±1.03		0.48		
1	Did you exercise for at least 15 minutes?	1.13±1.17			0.84	
11	Did you stretch your muscles or do any health-promoting activities?	1.38±1.11			0.80	
15	Did you stretch or rotate your body?	2.04±1.63			0.72	
4	Did you eat fatty food?	1.95±0.83				0.72
5	Did you stand for a long time?	1.92±1.14				0.73
13	Did you lift heavy objects or did you bend too much?	1.84±1.09				0.56
Eigin			7.40	3.30	2.01	1.60
Percentage of predicted cumulative variance			33.65	48.68	57.85	65.13
Cronbach's alpha			0.96	0.80	0.72	0.53

*Factor 1: Health-destroying eating habits and behaviors, Factor 2: Health-promoting eating habits and behaviors, Factor 3: Health-promoting physical activities, Factor 4: Health-destroying habits

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Table 3. Correlation between health-promoting behaviors and destructive health behaviors with anxiety and demographic characteristics of pregnant women

Pregnancy behaviors	Woman age	Education	Gestational age	Number of pregnancies	Number of abortions
Health-promoting behaviors	0.99	0.013	-0.004	0.156	0.055
p-value	0.167	0.862	0.961	0.028	0.438
Health destructive behaviors	-0.038	-0.144	-0.234	-0.039	0.038
p-value	0.598	0.048	0.001	0.586	0.595

Correlation coefficients were reported for quantitative variables of age, education, and gestational age and with Pearson correlation, and for qualitative variables, number of pregnancies and number of abortions with Spearman statistics.

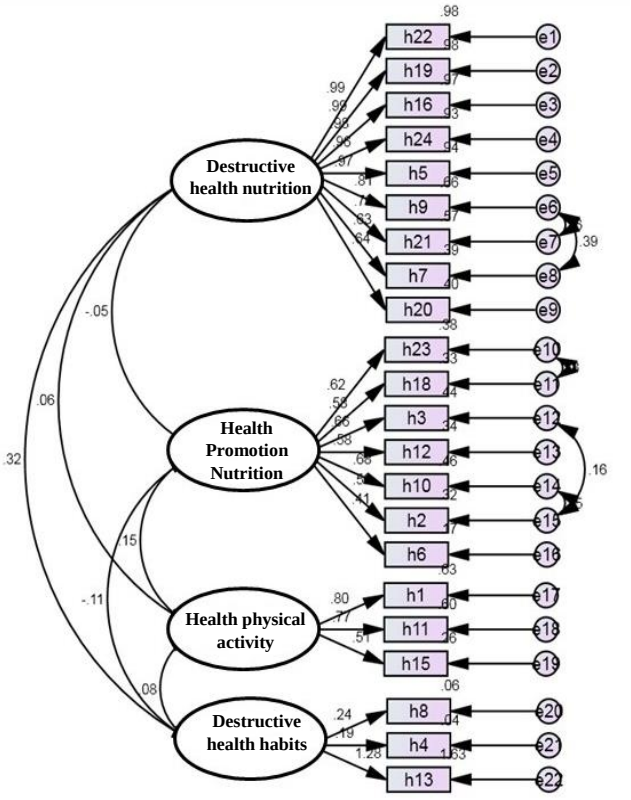


Figure1. Structure of pregnancy health behaviors: A modified model of confirmatory factor analysis

Discussion

This study showed that the Persian scale of pregnancy health behaviors has appropriate validity and reliability in Iranian society. The four sub-components of this scale in Iranian pregnant women have four domains of destructive health behavioral/nutrition habits, health promoting behavioral/nutrition habits physical activity promoting health, and destructive health physical habits. In terms of intercultural studies, the extracted factors are similar and different from other researches. The sub-components of this questionnaire have been reported in three articles, in none of which has a reliability test been reported as a retest test (2, 18, 22). This questionnaire has been reported in the study of Lobel et al. as seven factors: smoking, healthy nutrition, pregnancy vitamin intake, stretching exercises, physical pressure, and unhealthy eating (2). In factor analysis of two other articles, two sub-components found. In the study of Auerbach et al., factor analysis of the Pregnancy Health Behaviors Questionnaire was uploaded in two factors: health-promoting behaviors and destructive health behaviors (18). In the study by Auerbach et al., which performed a factor analysis of the Pregnancy Health Behavior Questionnaire on 165 English-speaking American pregnant women, the number of factors was 2. The first factor, which was a health-promoting behavior, had a Cronbach's alpha internal consistency of 0.71. The second factor, which was a health-destroying behavior, had an internal consistency of 0.66 (22).

The difference between factor analysis of these two studies is that in this study, Auerbach binary agents separated both health-promoting behavioral / nutritional and destructive health behavioral / nutritional enhancers from physical destructive ones. In other words, Auerbach's health-promoting behaviors in the factor analysis of this study became two separate factors of behavioral / nutritional enhancers and physical enhancers. Also, the second factor of Auerbach, ie destructive health behaviors, in this study became two smaller factors of destructive health behavior / nutrition and physical destructive behaviors.

The four-component PHBS sub-model of this study has several advantages over the two Auerbach sub-components. First, the internal consistency of the quadruple model is greater than that of the two. Second, the special value of the questions in the binary model was 0.44-0.64 in the health-promoting factor and 0.28-2.76 in the destructive health factor. While in this study, the special value of the questions loaded in all factors was higher than the Auerbach binary model. Third, in the exploratory factor analysis, only one of the two Auerbach factors was confirmed, but in this study, all four subcomponents of the questionnaire were confirmed. Comparing the means of health-promoting

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behaviors and destructive health behaviors, it was found that although the rate of health behaviors is higher than destructive health behaviors, but the rate of destructive behaviors is also high. Studies inconsistent with these results have shown that unhealthy nutrition during pregnancy is associated with reduced maternal age. Also, as mothers age increases, healthy nutrition during pregnancy increases too (23). Another study showed that occupation was significantly associated with health-promoting behaviors in pregnancy (10). In explaining the inconsistency of these results with previous studies, it can be said that differences in measurement tools can lead to different results. In this study, a questionnaire for pregnancy behaviors was used, while other studies used the Health-Promoting Lifestyle Profile tool (HPLP). One of the limitations of this study was that in the pregnant population, there was no woman with gestational age less than 12 weeks. It is suggested that future studies examine pregnancy behaviors in women with gestational age less than 12 weeks. In particular, destructive health behaviors were more common at lower gestational ages than at higher gestational ages. As a result, the Persian scale of pregnancy behaviors in the Iranian population, despite the different cultural and racial differences with English-speaking pregnant women, has good psychometric, reliability and validity properties. Therefore, this study suggests that gynecologists and midwives and health care providers use the PHBS scale, which has the characteristics of shortness and ease of use, to measure health behaviors in pregnancy. Also, clinicians should consider the role of education and gestational age of pregnant women as a negative factor influencing health behaviors.

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