



## Validation of Iranian Version of Pregnancy Related Anxiety Questionnaire

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### ABSTRACT

**Background:** Pregnancy is an acute period in the lifetime of women, during which numerous excitatory physical and social changes occur. The purpose of this study is confirmatory factor analysis of Pregnancy Related Anxiety Questionnaire (PRAQ) that is designed in Iranian pregnant women population.

**Methods:** A total of 170 pregnant women in health centers of Kerman city were chosen through random sampling method and completed PRAQ questionnaire and Beck Anxiety Inventory (BAI). In this study, confirmatory factor analysis and concurrent validity are used to evaluate the validity of models; and to test-retest and Cronbach alpha were used for evaluating external and internal reliability in SPSS-19 and the AMOS software to evaluate reliability of models.

**Results:** Confirmatory factor analysis gave an acceptable value for the latent PRAQ in the question scale and 5 micro-scale level. Furthermore, significant correlation between the components and the overall scale of the PRAQ questionnaire with the BAI confirmed concurrent validity of questionnaire. The reliability of questionnaire is confirmed based on Cronbach's alpha coefficient value of 0.78 that calculated 0.69–0.76 for the five-factors. A month later, reliability coefficient amplitude of test-retest on forty pregnant women was between 0.65 and 0.72 which shows the reliability of PRAQ over time.

**Conclusions:** The short form of anxiety during pregnancy questionnaire has the essential psychometric properties. In this study, five-factors extracted in the PRAQ were adapted with the factors extracted from the original version. This study introduces an instrument that can be benefit in measuring anxiety and concerns of women during pregnancy.

**Keywords:** Anxiety, Iranian, pregnancy, validation

### INTRODUCTION

Pregnancy anxiety is a powerful factor in prediction of negative outcomes in birth and infant.<sup>[1]</sup> Various

studies have indicated that pregnant women are faced to new concerns, and numerous mental questions about developing fetus and future child stressed her. These issues have a devastating effect on the mental health of pregnant women;<sup>[2]</sup> Studies have indicated neuro immunology models that stress during pregnancy affect maternal mental health and fetal growth and can lead to preterm birth.<sup>[3]</sup>

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For many women, pregnancy represents a time of increased vulnerability to mental disorders. A significant number of women experience the very first anxiety disorders or mood changes during pregnancy or in the first few months after delivery; and those, who have a history of psychiatric disorders, are at increased the risk of repetition or recurrence of symptoms. Psychological distress during pregnancy has negative impact on women's life quality and their personal well-being; and if remain untreated or undiscovered, it may have a negative effect on the growth of fetuses and infants. Despite it, the rate of treatment and diagnosis of anxiety before birth is warning low.<sup>[4,5]</sup>

Anxiety during pregnancy and childbirth also plays a role in the baby suffering from schizophrenia<sup>[6]</sup> and emotional disorders in the future,<sup>[7]</sup> autism,<sup>[8]</sup> hyperactivity,<sup>[9]</sup> and shortness of breath during neonatal period.<sup>[10]</sup> There is a direct relationship between anxiety of mother and abnormal fetal brain development,<sup>[11]</sup> fetal distress,<sup>[12]</sup> and a reduction in mental development at the age of 2.<sup>[13]</sup> Prenatal anxiety of mother affect on sleep disorders of children, and behavioral problems in early childhood;<sup>[14]</sup> and in the importance of mental health in pregnancy this issue is notable that the root of poor attachment of parent-child during postpartum depression lies in pregnancy period.<sup>[15]</sup>

Many studies have shown the relationship between high levels of cortisol (which is influenced by the mother's anxiety and stress) with the risks of low birth trauma and psychological disorders.<sup>[16]</sup>

The existence of anxiety in pregnancy and also in childbirth, have harmful effects and in the long-term anxiety, smooth muscles are constricted by stimulating the autonomic nervous system and in result, the uterus-placental blood flow and oxygenating to the uterus is decreased, and as a result, fetal heart rate pattern become abnormal and risk of preterm delivery will increase.<sup>[17]</sup> Hence, premature birth and low birth weight leads to negative consequences in physical and cognitive development of children and these babies are more likely to suffer from cerebral palsy, learning disabilities, and other disabilities.<sup>[18]</sup> Moreover, anxious and depressed mothers are not sensitive to the messages sent by their children.<sup>[19]</sup>

Therefore, the prevalence of anxiety disorders may have reverse effects on results of midwifery, embryonic, and infancy.<sup>[4]</sup> It is also noteworthy to mention that mental health problems during pregnancy has been studied in 90% of high-income countries; whereas in this field, only 10% of low and middle income countries have available information.<sup>[20]</sup>

Studies have indicated that pregnant women may have severe concerns about the failure of the embryonic

period, concerns about pain and worry about changes in their personal lives as a result of pregnancy and childbirth.<sup>[21]</sup> The shortcomings in measuring mental state of the mother during pregnancy can estimate their mental turmoil far less than the actual values.<sup>[22]</sup> While, the early detection, prevention and the management of anxiety during pregnancy make women able to meet the challenges of pregnancy.<sup>[23]</sup> Therefore, testing the fears and concerns specific to pregnancy and reviewing changes of pregnancy related anxiety and clinical factors associated with it seems essential.

## METHODS

The research design was descriptive correlational. The population included all pregnant women who visited medical health centers in Kerman during the second half of 2014 for medical cares. From the above population, 170 women were selected and were evaluated with available sampling method over 1 month. For this reason, Kerman city is divided into four regions of North West, Northeast, Southwest, and Southeast and one health center randomly selected from each region. Criteria for inclusion were being Iranian, having enough knowledge to fill in questionnaires of the study, having general health as well as having a normal pregnancy and healthy fetus.

Determining the sample size in the exploratory analysis follows the general principle of sampling (i.e., the number of subjects should always be greater than the number of the questions of the questionnaire);<sup>[24]</sup> a range of 5–20 participants for each question is considered.<sup>[25]</sup> For this reason, based on Stevens' theory and according to the number of questions, 17 questions, the sample size was determined as 170 individuals (10 individuals per question); by taking a 10% probability of loss, the questionnaires were distributed among 187 pregnant women and finally 170 questionnaires were completed by the pregnant women.

### Demographic questionnaire

Demographic information such as age, number of pregnancies, and education were collected using demographic questionnaire.

### Pregnancy Related Anxiety Questionnaire

This questionnaire was the main research instruments that evaluates fears and concerns about related to pregnancy and has been made in 1989 by Vanden Berg.<sup>[26]</sup> Vanden Berg short form Pregnancy Related Anxiety Questionnaire (PRAQ-17) has 17 items. Exploratory factor analysis of the questionnaire revealed five-factors: Fear of childbirth (three items), fear of giving birth to a child with physical or mental health issues (four items), fear of change in the marital relationship (four items), fear of changes in mood and its consequences on the child (three items), self-centered fear

or fear of the changes in personal life of mother (three items). The final score is obtained from the sum of the scores of the questionnaire. Each item is graded between one and seven. Hence, the pregnancy anxiety grade can be between 17 and 119. It is necessary to say that, first, the questionnaire was translated to Persian by permission of its designer and in continue, it was returned to English by two English language experts. Existence differences between English and Persian versions were evaluated and these differences were decreased to minimum using from frequent review process. Then, three experts of psychology field confirmed the content validity and cultural adaptation of pregnancy anxiety questionnaire.

**Beck Anxiety Inventory**

The questionnaire consists of 21 items, which covers the most common symptoms of anxiety. The phrase reflects one of the symptoms of anxiety that usually people who are clinically anxious or who are in a state of great anxiety experience it. The ratings are classified as not at all (0), mildly (1), moderately (2) and severely (3). If participant have a score of 0–7, no anxiety. If between 8 and 15 is mild anxiety, if between 16 and 25, the moderate anxiety and if between 26 and 63 indicate severe anxiety.<sup>[27]</sup> Studies showed that the questionnaire has high reliability and validity. Its internal consistency coefficient is 0.92, test-retest reliability is within a week of 75/0, and the correlation of its items varies from 0.30–0.70. Five types of content validity, concurrent, construct, diagnostic and a factor for this test measured which all of them indicative the effectiveness of this tool in measuring of anxiety in Iranian population.<sup>[28]</sup>

This study was conducted regarding to permission from the health centers of Kerman and principles of morality and ethics. All participants participated in the study consciously, and they were assured that the information gathered will be used only for the purpose of research. Participants are also noted that are able to withdraw from the research process any time they want.

To analyze the data, correlation matrix is used. To evaluate the reliability of questionnaires, Cronbach’s alpha and split-half method and to evaluate validity and factor structure of questionnaires, confirmatory factor analysis and model parameters in the AMOS (Analysis of moment structure) SPSS software version 20 (SPSS Inc., Chicago, IL, USA) are used.

**RESULTS**

In this study, 187 pregnant women participated in the confirmatory factor analysis which 170 women filled out the PRAQ questionnaire. Table 1 shows participants’ details (with a mean age of 29.5 ± 5.7 years).

**Validity**

In this study, to evaluate the validity of PRAQ factor analysis and concurrent validity are used.

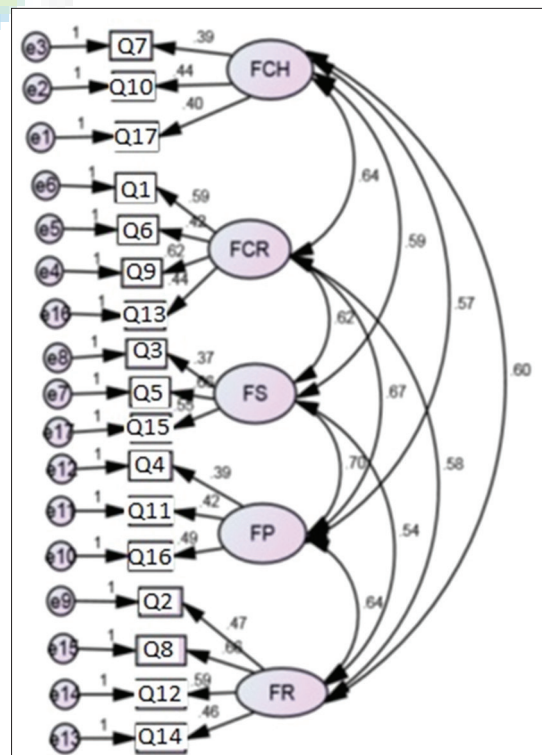
*The analysis of factors*

a confirmatory factor analysis was conducted in order to verify the assumed factor structure in the measurement of anxiety in pregnant women. Our purpose in doing this was a comparison between the initial structural matrix and the new structural one through which the content of each factor as well as the initial structural matrix was reconfirmed. Table 2 presents loading factor on each of the questions that shows the correlation of each question with the desired area. As mentioned in table and Figure 1 show, the factor loadings on subjected factors are significant. In factor analysis, the minimum load factor was considered as 0.30.

**Table 1: Demographic characteristics (n=170)**

Mother’s characteristics	Mean±SD or n (%)
Age	
Mean±SD	29.5±5.7
Education	
Under Diploma	42 (25)
Diploma	97 (57)
Bachelor of science	16 (9)
Master of science	10 (6)
Not pregnant	5 (3)
1	59 (35)
2	48 (28)
3	36 (21)
4 and more	27 (16)

SD=Standard deviation



**Figure 1: The output model for the Pregnancy Related Anxiety Questionnaire factors in AMOS**

**Table 2: Factor structure short Pregnancy Related Anxiety Questionnaire**

Factors	Fear for changes	Fear for the integrity of the baby	Fear for delivery	Concern about future mother-child, father-child relationship and partner relationship	Concern for oneself and the partner relationship during pregnancy
I am concerned about my sudden mood changes	0.37				
I am concerned about my irritability	0.66				
I am concerned about becoming preoccupied with myself, and feel that I might be turning inward	0.55				
I am afraid that my baby will not be healthy		0.59			
I fear that my fetus is malformed or deformed		0.42			
I am afraid that my baby will be brain damaged or lacking in mental capacity		0.62			
I fear that my baby will die after birth		0.44			
I fear the pain during labor and delivery			0.39		
I am afraid of the labour, because I have never been through it before, I am afraid of the unknown			0.42		
I am worried that I might shout and scream during labor, that I might lose control of myself			0.49		
I am concerned about my unattractive physical appearance				0.39	
I am concerned that my body will not regain its normal shape after the conclusion of pregnancy				0.44	
I worry because I have put on so much weight				0.40	
I am a little worried that our baby might be less attractive and I am afraid of the reactions of others					0.47
I am a bit afraid that we will have to give up a lot of things for the baby					0.66
Sometimes I worry that becoming a mother will change me a lot and will make me feel old, for example					0.59
I worry about the baby turning out to be a difficult child					0.46

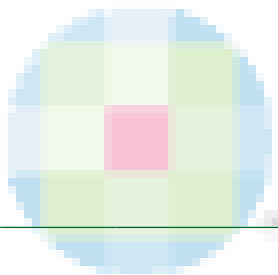


Table 3 results shows the results of indicators model for examining the factor structure of the questionnaire through confirmatory factor analysis. According to the values of indicators, confirmatory factor analysis pattern confirmed the existence of five factors in the PRAQ questionnaire.

**Concurrent validity**

Beck Anxiety Inventory (BAI) was used to evaluate concurrent validity that its correlation coefficient with the subjected tools and its related factors have been reported in Table 3. As can be seen, based on the Pearson correlation coefficients, there is a positive correlation ( $P < 0.01$ ) between the total score of the PRAQ questionnaire and its factors and BAI. Internal correlation of factors with each other and with the total score shows the reliability of factor structure. As much the correlation of factors with the total score is higher, and then the internal validity of the questionnaire is increased. In this study, according to Randal *et al.*<sup>[29]</sup> for Tucker–Lewis Index (TLI) significant, TLI above 0.9 (TLI  $\leq 0.95$ ) and comparative fit index near to 1 are supposed as significant value [Tables 3 and Figure 2].

**Table 3: Confirmatory factor analysis fit indexes for the 5-factor model in AMOS**

RMSEA	NFI	CFI	AGFI	TLI	IFI	GFI	$\chi^2$ df	$\chi^2$	Fitness index
0.05	0.9	0.94	0.92	0.9	0.94	0.95	3.75	51	80.56

RMSEA=Mean square error of approximation, NFI=Normed fit index, CFI=Comparative fit index, AGFI=Adjusted goodness of fit index, TLI=Tucker–Lewis index, IFI=Incremental fit index, GFI=Goodness of fit index

Based on the result of second-order factor analysis, correlation or loadings of each factor with total scale are: Child with physical or mental issues factor (0.74), fear of childbirth (0.70), fear of changes factor (0.75), change in marital relationships (0.72), and self-centered fears (0.77); that all of the factors were statistically significant ( $P < 0.01$ ) [Table 4 and Figure 2].

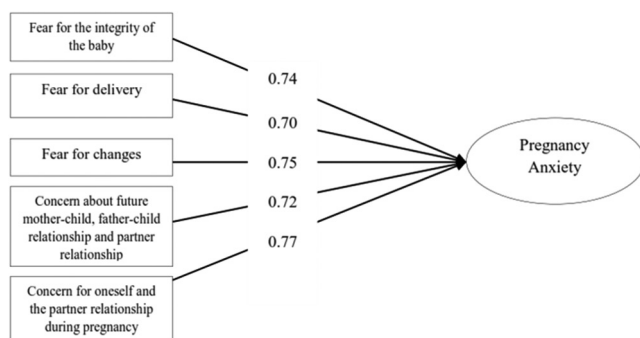
**Reliability**

To estimate the stability coefficient of instruments using from test-retest method, sixty participants were selected from statistical sample. They filled out the pregnancy anxiety scale and they were examined again with the same scale 14 days later. Cronbach’s alpha is used to

**Table 4: Correlation coefficients and internal consistency between the scales and original questionnaire**

Factors	Fear for changes	Fear for the integrity of the baby	Fear for delivery	Concern about future mother-child, father-child relationship and partner relationship	Concern for oneself and the partner relationship during pregnancy	General anxiety scale
Fear for changes	1					
Fear for the integrity of the baby	0.62**	1				
Fear for delivery	0.70**	0.66**	1			
Concern about future mother-child, father-child relationship and partner relationship	0.59**	0.64**	0.57**	1		
Concern for oneself and the partner relationship during pregnancy	0.54**	0.58*	0.67**	0.60**	1	
General anxiety scale	0.77**	0.74**	0.70**	0.75**	0.72**	1
BAI	0.64**	0.70**	0.59**	0.66**	0.62**	0.74**

\*\*P<0.01. BAI=Beck Anxiety Inventory



**Figure 2: The confirmatory five-factor model of Pregnancy Related Anxiety Questionnaire**

calculate reliability, split-half coefficient (split method) and test-retest method is used by Pearson correlation. The results are shown in Table 5.

As the above table shows the results of Cronbach's alpha coefficient of PRAQ has a high internal consistency (Cronbach's alpha = 0.78). Cronbach's alpha for the scales are (self-centered fear = 0.69), (fear of child with health issues = 0.74), (fear of childbirth = 0.76), (fear of change = 0.72) and (fear of change in marital relationships = 0.70). Retest reliability within a month for the PRAQ is 0.74 and for its dimensions are varied from 0.65 to 0.72.

## DISCUSSION

Uncontrolled stress affects the mother's health as well as the health of the fetus. Early diagnosis of pregnant women stress and also providing the necessary guidelines, can cause pregnant women to have a pleasant experience. So, a tool with high reliability and validity seems necessary to achieve this goal.<sup>[30]</sup>

The results showed that the psychometric properties of the Persian version of Vanden Berg pregnancy anxiety

**Table 5: Reliability of Pregnancy Related Anxiety Questionnaire**

Factors	Cronbach alpha	Split-half reliability	Test-retest
Fear for changes	0.69**	0.92**	0.72**
Fear for the integrity of the baby	0.74**	0.60**	0.65**
Fear for delivery	0.76**	0.57**	0.69**
Concern about future mother-child, father-child relationship and partner relationship	0.72**	0.64**	0.72**
Concern for oneself and the partner relationship during pregnancy	0.70**	0.59**	0.68**
General anxiety scale	0.78**	0.64**	0.74**

\*\*P<0.01

questionnaire for use in Iranian population and using it in clinical practice and research is acceptable.

The results of the factor analysis of questionnaire showed that the results in Iran to support the five-factor structure. This finding in total was consistent with the results of the factor analysis of the original developers of questionnaire,<sup>[26]</sup> it can indicate that despite cultural differences in psychological variables in different societies, concerns about pregnancy related issues is public and global. Furthermore, the concurrent validity of the questionnaire showed that this tool has a high correlation with its parallel questionnaire (BAI), and it seems that they measure similar structure.

The analysis focused on reliability of questionnaire that examined two aspects of test-retest reliability and internal consistency of questionnaire had led to good results. In terms of reliability and stability of the test that examined through test-retest coefficient, the results showed that the questionnaire is valid and its result can be trusted in multiple implementations. Also, high coefficient rates of internal consistency show that questionnaire has a consistent structure; which is consistent with the results of Huizink *et al.*<sup>[31]</sup> and Babanazari and Kafi<sup>[32]</sup> in this regard.

From obtained correlations, pregnancy anxiety has the most positive correlation with “relationship during pregnancy oneself and the partner concern for” subscale which is equal to  $r = 0.77$ . Therefore, this subscale has the most powerful correlation to pregnancy anxiety. This indicates important and vital role of marital relations and social support in experienced anxiety level among pregnant women. Perhaps it can be said when women experience the pregnancy, they are exposed to excitement and worried about how to relate with others, particularly their wives. The lowest correlation was related to the subscale of “fear for delivery” that is equal to  $r = 0.70$ . So, it may be said that the spouse’s support, having enough information about the process of delivery and the positive acceptance of delivery have been effective in reducing the subscale of “fear for delivery.” Generally speaking, due to the obtained correlations the questionnaire is of high factor validity.

The high coefficients of internal similarity also indicated that the questionnaire has a coherent structure; this shows that almost all dimensions of pregnancy anxiety have a near relationship with each other so that any change in one of them affects the other dimensions as well as the total amount of pregnancy anxiety.

## CONCLUSIONS

So, regarding to results of present study, it can be suggested that assessment of anxiety and response of pregnant women to the anxiety during pregnancy, along with monitoring and evaluation of health care is very beneficial. Special educational and therapeutic approaches to identify stressors and training coping strategies to them can be useful in pregnant women.

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## Conflicts of interest

There are no conflicts of interest.

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