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Investigation of psychometric properties of Persian version of Pregnancy-Related Anxiety Questionnaire-Revised 2 (PRAQ-R2) for primiparous women

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ABSTRACT

Introduction and purpose: Pregnancy anxiety is a strong predictor of negative birth outcomes. Therefore, carrying out adequate assessment of pregnancy-related anxiety as well as conducting extensive research on this area is of paramount importance and this, in turn, necessitates the provision of specific reliable, valid tools. For instance, Pregnancy-Related Anxiety Questionnaire – Revised 2 (PRAQ–R2) is a widely used instrument. Taking a step in this perspective, the present study is aimed at determining psychometric properties of PRAQ-R2 for a sample of primiparous women in Iran. *Method*: This descriptive-cross sectional study was undertaken based on 183 primiparous women in Tehran, Iran. The convenience sampling method using is Google Form. To this aim, PRAQ–R2, Five-Facet Mindfulness Questionnaire (FFMQ), the Wijma Delivery Expectancy-Experience Questionnaire (W-DEQ) along with the required demographic information were entered and transformed into a Google-Form survey and distributed among primiparous, pregnant women through social networks. *Results*: Internal consistency that measured with Cronbach's alpha was 0.85. The alpha coefficient for the subscales was also higher than 0.77. PRAQ-R2 questionnaire has a positive and significant relationship with W-DEQ and has a negative and significant relationship with FFMQ, which indicates the appropriate convergent and divergent validity of the questionnaire. Finally, Confirmatory Factor Analysis (CFA) showed that the three-factor model enjoys an acceptable fit. *Discussion and conclusion*: PRAQ-R2, suggesting acceptable validity and reliability measures for assessing primiparous women's pregnancy-related anxiety, thus, can be used for research and clinical purposes.

Keywords: anxiety, pregnancy, validity, reliability

1. INTRODUCTION

Pregnancy-related anxiety refers to worries about childbearing, the health of the child, changes in mother's body and physical appearance, and parenting for the future (Blackmore et al., 2016). anxiety during pregnancy is a strong and important factor in predicting negative outcomes at birth (Kane et al., 2014). For example, pregnancy anxiety is associated with preterm delivery, low Apgar score and low birth weight (Ding et al., 2014), preeclampsia and increased cesarean section (Ravid et al., 2018), etc. Hence, we are need of special anxiety assessment. One of the employed tools in this area is PRAQ which was developed by Van den Bergh (1990) then revised and renamed PRAQ-R by Huizink (2004). This assessment tool was adapted for use in all pregnant women with any pregnancy frequency in 2016 and renamed PRAQ-R2 (Huizink et al., 2016). The newly developed questionnaire was consisted of 10 items and 3 factors.

The psychometric properties of the questionnaire in nulliparous and parous women in a sample of southwestern Finland indicated that the good reliability and validity (Huizink et al., 2016). Mudra et al., (2019) investigated the German version of PRAQ-R2 for women in the third trimester of pregnancy. The results showed that the Cronbach's alpha for the questionnaire was 0.85 and it ranged between 0.77 and 0.9 for the subscales. Moreover, findings approved the validity of PRAQ-R2. Likewise, Reymond et al., (2020) examined the French version of PRAQ-R2. They also obtained three factors. The results of their study similarly revealed that the questionnaire and its subscales enjoyed a high degree of internal consistency (> 0.80). The researchers compared the convergent validity of this questionnaire with that of STAI and the results showed that it possessed an acceptable level of convergent validity.

Accordingly, Derya et al., (2018), surveyed PRAQ-R2 on primiparous and multiparous women in Turkey. They found that PRAQ-R2 had a three-factor structure. It was also revealed that the Cronbach's alpha for PRAQ-2 was range from 0.81 to 0.93 for multiparous group and range 0.87-0.94 for primiparous groups. Test-retest reliability and parallel-forms reliability also showed an acceptable degree of reliability for the questionnaire. Given the importance of assessing pregnancy-related anxiety and the lack of clear psychometric properties of PRAQ-R2 in a sample of Iranian pregnant women, the present study aims to investigate the psychometric properties of PRAQ-R2 in a sample of primiparous women in Iran.

2. MATERIALS AND METHODS

Participants and Design of the Study

A descriptive - cross sectional psychometric methodology was adopted in the present study. Participants of the study completed the questionnaires during August to November 2019 included 183 primiparous pregnant women which were selected via convenient sampling. First, the required information and the questionnaires (PRAQ-R2, W-DEQ, and FFMQ) were entered and transformed into a Google Form survey and distributed among participants through social networks including Telegram, WhatsApp, E-mail, and Instagram. The criteria used in participating in this study were as follows: 1) patients informed consent, 2) being a primiparous woman, and 3) patients with literacy skills. And finally, the participants were asked to fill out PRAQ-R2, W-DEQ and FFMQ.

Questionnaires

Demographic/Clinical Factors

The participants were initially presented with demographic/clinical information including age, gender, and level of education.

Pregnancy-Related Anxiety Questionnaire-Revised2 (PRAQ_R2)

In 2016, this assessment tool was adapted to study all pregnant women with any pregnancy frequency based on PRAQ-R. It was thus renamed PRAQ-R2 (Huizink et al., 2016). The newly developed questionnaire also included 10 items on a Likert-type scale involving five values (1= "absolutely not relevant" to 5= "very relevant"). Besides, the questionnaire scores ranged from 10 to 50. It also contained three factors. The first factor was "fear of giving birth" (FOGB) and included three items (items 1, 2 & 6). The second factor was "worries about bearing a handicapped child" (WaHC) and involved four items (items 4, 9, 10 &11). And finally, the third factor was "concern about own appearance" (CoA) and composed of three items (items 3, 5 & 7).

The psychometric properties of the questionnaire in nulliparous and parous women in a sample of southwestern Finland indicated that the reliability of the questionnaire was higher than 0.8 in week 24 and week 34 groups. It was also higher than 0.7 for all subscales in weeks 24 and 34. In addition, it enjoyed an acceptable validity (Huizink et al., 2016).

Five-Facet Mindfulness Questionnaire

This scale has been developed by Baer et al., (2008) and includes 39 items and 5 factors. The factors involved observation, description act with awareness, non-judging to inner experience, description and nonreactivity. Concerning the study conducted in

Iran in relation to this scale, the internal consistency across the total scale, i.e., the questionnaire was 0.8. With regard to the subscales of observation, description, act with awareness, non-judging and nonreactivity, the internal consistency values were 0.71, 0.83, 0.81, 0.73, and 0.55, respectively. Test-retest reliability of this scale was also 0.80 (P=0.001), indicating acceptable reliability of this questionnaire. The positive significant correlation between this scale and all dimensions of personality (except neuroticism) highlights the acceptable convergent validity of this questionnaire. Besides, in order to examine the convergent validity, the correlation between this questionnaire and psychological wellbeing questionnaire was calculated. The results revealed that there is a positive significant correlation between all dimensions of mindfulness and six components of psychological wellbeing, i.e., personal growth, spirituality, relationship with others, self-following, life satisfaction, happiness and optimism). Negative correlations were observed between five facets of mindfulness and all symptoms of the disorders checked in 25-SCL. Generally, the validity and reliability of this questionnaire were reported as being acceptable in the study done by Ahmadvand et al., (2013).

The Wijma Delivery Expectancy-Experience Questionnaire *(W-DEQ)*

This questionnaire involves two forms, i.e., Form A and Form B. The former form would be examined before delivery and the latter form would be taken into account after delivery. Besides, the W-DEQ has been developed to assess and investigate fear of delivery by means of measuring mother's feelings across delivery, expectations, and delivery experience. It includes 33 items scored on 6-point Likert scale from 1=completely disagree to 6=completely agree. Research has shown that the reliability of this scale via measuring the internal consistency and split-half method is higher than 0.87 (Wijma et al., 1998).

Statistical Analysis

The data was analyzed by using SPSS-25 and LISREL 8.8. First, Mean and Standard Deviation (SD) values for some variables of the study and Frequency and Percentage for some other demographic variables were calculated. Next, the internal consistency of PRAQ-R2 was measured with Cronbach's Alpha. In addition, the convergent validity of PRAQ_R2 was investigated via spearman correlation coefficient between the scores on PRAQ-R2 and W-DEQ. Moreover, the divergent validity of PRAQ-R2 was explored by calculating the correlation between PRAQ-R2 and FFMQ. Furthermore, factor structure of PRAQ-R2 was calculated via Confirmatory Factor Analysis (CFA). Finally, the following proportion indexes were employed to assess the adequacy of the model: Chi-square, Degrees of Freedom (X^2/df), Comparative Fit Index (CFI), Normed Fit Index (NFI), Goodness of Fit Index (GFI), and the Root Mean Square Error of Approximation (RMSEA). Regularly, X^2/df< 3, CFI ≥ 0.95, RMSEA < 0.08, NFI ≥ 0.90, and GFI ≥ 0.90 are acceptable values (Schermelleh-Engel et al., 2003).

3. RESULTS

The present study involved participation of 183 primiparous women with the average age of 29.75 ± 5.07. Average duration of pregnancy was 6.42 ± 1.22. Concerning the level of education, 26 women (14.2 %) had education less than a high school diploma, 64 women (35 %) had taken a diploma, 6 women (3.3 %) had received an associate's degree, 68 women (37.2 %) had a bachelor's degree, and finally 19 women (10.4 %) had a master's degree or higher. Seventeen women (9.3 %) reported that they received weak support from their husbands. In terms of financial status, 32 women (17.5 %) were poor, 125 women (68.3 %) were average, and 26 women (14.2 %) were rich. Caesarean section was chosen by 90 women (49.2 %) to deliver their baby. The results revealed that the internal consistency measured by Cronbach's Alpha was 0.85 for total score. Coefficient alpha values of 0.77, 0.89, 0.77 were obtained for the subscales of FOGB, WaHC and CoA, respectively. As it has been displayed in Table 1, all items, if omitted, would reduce the alpha value, indicating appropriateness of the items (Table 1).

Table 1 Scale Reliability Analysis

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
pr1	13.83	61.647	.501	.839
pr2	13.98	59.390	.573	.833
pr3	14.30	59.376	.500	.840
pr4	14.78	60.098	.578	.833
pr5	14.96	58.092	.589	.832
pr6	14.60	59.055	.484	.842

pr7	14.44	60.380	.439	.846
pr9	14.97	58.697	.649	.827
pr10	15.05	59.151	.630	.829
pr11	14.90	60.045	.608	.831

Note: pr1-pr11 is questions of PARQ-R2 that question eight have been replaced with question one so that it can be used by all pregnant women. To view the questionnaire and its items, you can refer to the Appendix part of the main article of Huizink et al., (2016)

Convergent and Divergent Validity

Convergent validity was analyzed by assessing the correlation between PRAQ-R2, W-DEQ. Since the data was not normally distributed, Spearman's correlation coefficient was used. The results indicated that PRAQ-R2 and its subscales had a positive significant correlation with W-DEQ. These results, thus, show that PRAQ-R2 enjoys an acceptable convergent validity. Moreover, the correlation between PRAQ-R2 along with its subscales and FFMQ was examined in an attempt to assess the divergent validity. The results demonstrated that there existed a negative significant correlation between PRAQ-R2 and its subscales except FOGB, suggesting the divergent validity of this questionnaire (Table 2).

Table 2 Convergent and Divergent Validity

	PRAQ-R2	WaCH	FOGB	COA	W-DEQ
WaCH	.735**				
FOGB	.756**	.330**			
COA	.750**	.353**	.412**		
W-DEQ	.661**	.422**	.591**	.493**	
FFMQ	-.202**	-.150*	-.095	-.199**	-.388**

**p< 0.01, *p< 0.05

Confirmatory Factor Analysis (CFA)

LISREL 8.8 software was employed to CFA. Given that a three-factor model had been obtained in the preliminary study (Huizink et al., 2016), the same model was examined in the present study. The results showed that the three-factor model enjoys an acceptable fit (Table 3; Figure 1).

Table 3 Fit Indexes for PRAQ-R2

Fit indexes	$\chi 2$	DF	$\chi 2$/df	P-VALUE	GFI	NFI	CFI	RAMSE
Three factor	64.47	32	2.01	P=0.0005	0.93	0.95	0.97	**0.075**

4. DISCUSSION

The purpose of the present study was to investigate the psychometric properties of the Persian version of PRAQ-R2 for primiparous women in Iran. The reliability of this tool was confirmed by Cronbach's alpha method CFA indicated a structure with three factors which were named in a similar way to the original version. The results also showed that the PRAQ-R2 questionnaire has good convergent and divergent validity. The reliability of this questionnaire by Cronbach's alpha method was 0.85 for the whole questionnaire and range of 0.77 to 0.89 for the subscales. The results of the present study lend support to the results of some previous studies (Derya et al., 2018; Huizink et al., 2016; Mudra et al., 2019; Reymond et al., 2020). Huizink et al., (2004) studied a sample of nulliparous and parous women in southwestern Finland and indicated that the reliability of the questionnaire was higher than 0.8 in week 24 and week 34. Besides, the reliability of all the subscales of the questionnaire was higher than 0.7 in weeks 24 and week 34 (Huizink et al., 2016). Moreover, Mudra et al., (2019) showed that the Cronbach's Alpha for the questionnaire was 0.85. This value for subscales was between 0.77 and 0.90. Reymond et al., (2020)investigated the French version of this questionnaire and demonstrated that the questionnaire and its subscales enjoyed an acceptable level of internal consistency ($\alpha > 0.80$). Finally, Aksoy

Dery et al., (2018) reported that the Cronbach's alpha for PRAQ-2 was range frome 0.81 to 0.93 for multiparous group and range 0.87-0.94 for primiparous groups.

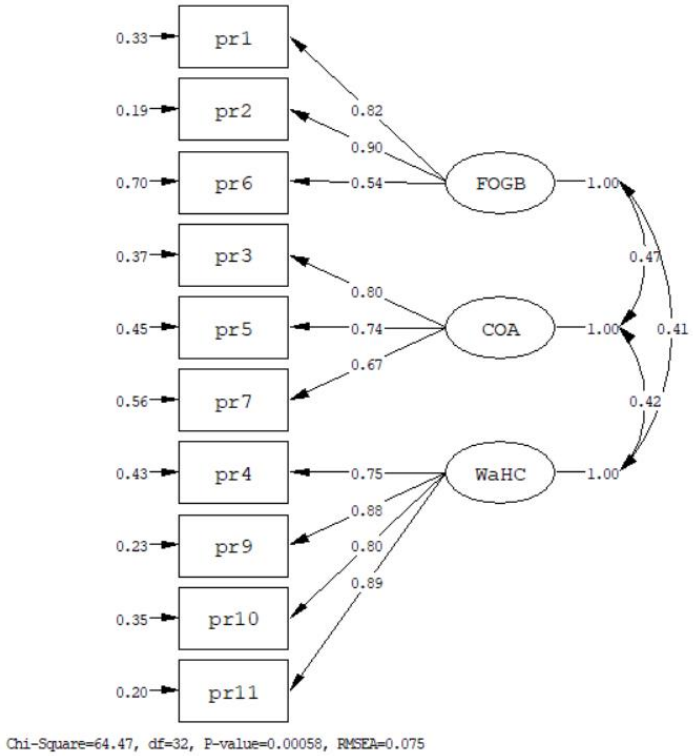

Figure 1 Confirmatory factor analysis for PRAQ-R2

CFA of PRAQ-R2 for a sample of primiparous women revealed a three-factor model in a way similar to the one outlined in the preliminary version of PRAQ-R2 (Huizink et al., 2016). The studies carried out into German, French, and Turkish versions also demonstrated a three-factor model (Derya et al., 2018; Mudra et al., 2019; Reymond et al., 2020). The negative significant correlation between FFMQ *and* PRAQ-R2 and its subscales suggested that PRAQ-R2 had an acceptable divergent validity. This finding can be explained via the following points. In reducing anxiety, mindfulness treatments are effective (Hofmann et al., 2010; Khoury et al., 2013; Khoury et al., 2015). In theoretical terms, it seems that mindfulness is the mechanism of the principal change in mindfulness-based treatments (Kabat-Zinn, 1982). Research has shown that mindfulness increases the activity of Left anterior cortex which plays a role in positive emotion expression. It also reduces the activity of Right cortex which is directly related to anxiety (Davidson, 2000). Moreover, Hötzel et al., (2011) have introduced a four-factor model for effect mechanism of mindfulness including 1. Attention regulation, 2. Awareness of the body, 3. Emotion regulation, and 4. Self-image change. These factors will eventually improve self-regulation. The research findings have demonstrated that mindfulness increases the ability to revise cognitions and modify attention. It also increases positive emotions and reduces negative emotions like anxiety (Gruber et al., 2014).

5. CONCLUSION

The positive significant correlation between PRAQ-R2 and its subscales and W-DEQ highlights the convergent validity of PRAQ-R2. Although it is believed that the current study lends some insight into psychometric properties of Persian version of PRAQ-R2, it also has some limitations, among which is the sample used. At one hand, the sample size of the present study was 183 and thus, further investigations with larger sample size are called for. On the other hand, this study concerned primiparous women and given the changes made to the questionnaire for use in primiparous and parouswomen, further research needs to be conducted to study samples of primiparous and parous women.

Application to Practice

The present study revealed that the Persian Version of PRAQ-R2 for primiparous women enjoys acceptable validity and reliability. Thus, it could be employed to deal with pregnancy-related anxiety in primiparous women for treatment and research purposes.

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Authors' contributions

Hamed Ghiasi: wrote the manuscript with input from all authors; performed the measurements.

Maryam Bakhtiari: supervised the project and contributed to designing and directing the project; contributed to the writing of the manuscript.

Seyed Mojtaba Ahmadi: contributed analyzing the data; contributed to the writing of the manuscript

Ethical approval

The study was approved by the Medical Ethics Committee of Shahid Beheshti University of Medical Sciences (ethical approval code: IR.SBMU.MSP.REC.1398.665).

Conflicts of interest

The authors declare that they have no conflict of interest.

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Data and materials availability

All data associated with this study are present in the paper.

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