Psychometric Evaluation of the Anxiety Assessment Scale for Pregnant Women in Labor in an Iranian Population

Abstract

Background: Anxiety Assessment Scale for pregnant women in labor (AASPWL), which includes nine items in two subdomains, has been designed as the first specific tool for assessing the anxiety of pregnant mothers in labor. Anxiety is one of the most common psychological complications of mothers in labor and one of the factors affecting the experience of childbirth and maternal delivery satisfaction. Until now, a questionnaire concerning women's anxiety in labor has not yet been used in Iran. This tool can better determine maternal anxiety compared to other general tools and help take necessary measures if needed; however, its validity and reliability have not been determined. Therefore, this study aimed to assess the psychometric properties of AASPWL in Iranian women. **Materials and Methods:** Through purposive sampling, 180 pregnant women hospitalized for labor between 2021 and 2022 were included in the study. AASPWL was evaluated regarding face and content validity using a quantitative method and construct validity (through confirmatory factor analyses). The questionnaire's reliability was determined using the internal consistency method. **Results:** In this study, the Content Validity Index (CVI) and Content Validity Ratio (CVR) of the AASPWL instrument were 0.96 and 0.97, respectively. The impact score of all items was above 1.5. The values of the fit indices confirmed the validity of the model. Cronbach's alpha coefficient was 0.72 for factor 1, 0.66 for factor 2, and 0.65 for the whole instrument. **Conclusions:** The Persian version of AASPWL is a reliable and trustworthy tool for evaluating labor anxiety regarding Iranian women.

Keywords: *Anxiety, Iran, labor, psychometric*

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Introduction

Pregnancy and childbirth, as the most critical events in a woman's life, provide an opportunity for a unique experience for most women. However, biological and psychological changes expose women to mental disorders, including anxiety, both during pregnancy and in the postpartum period.[1-4] Anxiety, as a complete psychological process, causes cognitive, emotional, physiological, and behavioral changes and acts as a warning signal of an imminent threat or danger.[5,6] According to the results of the studies, fear and anxiety among pregnant women in labor are mainly due to labor pain, midwifery injuries, emergency cesarean sections, possible complications, death, inability to perform maternal duties, and concern for the child's health. One of the other reasons for maternal anxiety during labor is fear of the hospital environment. Childbirth is often the first experience of hospitalization for many pregnant women. Furthermore, the anxiety experienced by pregnant women during labor may stem from their relationship with the hospital staff and the fear of being disregarded.[7-9]

Increased severity of pain and anxiety during labor can affect the mother's childbirth experience and her satisfaction with childbirth.[10] Cheung *et al.* found a negative relationship between maternal anxiety and feelings of control during labor.[11] Also, anxiety during labor was associated with prolonged labor, emergency cesarean sections, and lower childbirth self-efficacy.[12-14]

The anxiety of pregnant women in labor due to its secondary effects and problems in childbirth should be determined. Although tools such as the State-Trait Anxiety Inventory (STAI), Visual Analog Scale (VAS), and Wijma-Delivery

Expectancy Experience Scale (W-DEQ) are standard instruments to determine maternal anxiety in labor, there are no specific tools for assessing anxiety. In 2018, Durat *et al*. designed the first specific tool for assessing the anxiety of pregnant mothers in labor, known as the Anxiety Assessment Scale for pregnant women in labor (AASPWL). The questionnaire designed by Durat *et al*.[15] includes nine items in two subdomains. The use of a specific tool facilitates the determination of the mother's anxiety level in labor and helps ensure the provision of the necessary midwifery care. The mother's sense of control during labor, which is a critical predictor of a positive childbirth experience, will be improved by persistence in reducing the mother's anxiety during labor.[16]

Given the absence of a specialized labor anxiety measurement instrument in Iran and the lack of validation and reliability evidence for the AASPWL in the Iranian context, our study aims to examine the psychometric properties of the labor anxiety questionnaire. Using a valid and reliable tool and determining the level of anxiety among women in labor, we can help provide necessary and timely care for mothers.

Materials and Methods

This is a cross-sectional study with methodological approach in which the psychometrics of the specific labor anxiety questionnaire are considered a measurement tool. This study was conducted in a seven-months period between May and November 2022. Participants in this study were healthy pregnant women with term pregnancy admitted to the labor ward of Alzahra and Taleghani hospitals in Tabriz, Iran. Exclusion criteria in this study were having a high-risk pregnancy, including diabetes, hypertension, chronic diseases affecting the pregnancy such as cardiovascular, pulmonary, etc., psychological problems or a history of psychiatric hospitalization, and the experience of a tragic event during the last three months, including the death of relatives that impair a person's mental health.

The required sample size for factor analysis is five to ten samples per questionnaire,[17] which requires 90 samples, given nine items and ten people per item. In this study, 180 people were selected, and confirmatory factor analysis (CFA) was performed. The samples were selected through the convenience sampling method. The researcher identified the pregnant women in the labor wards of Alzahra and Taleghani hospitals. After reviewing the inclusion and exclusion criteria, the women were informed of the research objectives and procedures. Eligible women willing to participate in the study provided written informed consent and filled out the socio-demographic and obstetrics characteristics questionnaire and the AASPWL scale through interviews. The anxiety during labor questionnaire designed by Durat *et al*. includes nine items in two sub-dimensions. The motherhood constellation sub-dimension consists of three items, and the birth process sub-dimension consists of six questions. All nine questions are scored from 1 to 5. The positive questions are inversely scored, and the total score is divided by the total number of questions. Thus, the highest score is 5, and the lowest is 1.[15] After obtaining permission from the designer of the labor anxiety questionnaire, the original version of the instrument was translated from English to Persian by a person fluent in both English and Persian.[18] The research team reviewed the translated version. Later, two other bilingual translators translated the Persian version into English. In the next step, a review of the translated version was performed by two people familiar with specialized concepts and fluent in both languages, and the final version was obtained. Qualitative and quantitative methods were used for face validity. In the qualitative method, ten pregnant women hospitalized for labor were asked to comment on the items' difficulty level, inadequacy, and ambiguity. In the quantitative method, 20 women were asked to comment on the level of importance of items from five (absolutely important) to one (not important at all). Face validity was then quantitatively measured using the item impact method based on women's opinions. The item impact method was used to determine the importance of each item. The researcher calculated the impact score of each item according to the responses selected by women, based on the following formula separately: (Impact Score = Frequency (%) × Importance) (Frequency: percentage responses of 4 and 5; Importance: the average responses to the item). An impact score above 1.5 is approved.[19] Content validity was performed using both quantitative and qualitative methods. In the qualitative method, ten midwifery and reproductive health specialists were asked to review the translation of each question in terms of grammar and appropriate vocabulary, place phrases in the correct order, and present their corrective feedback. The quantitative method used content validity ratio (CVR) and content validity index (CVI). The questions' relevance, transparency, and simplicity were evaluated using the four-point Likert scale to determine the CVI. A score above 0.79 was considered acceptable. To determine the CVR, experts were asked to examine each question regarding necessity based on a four-point scale.[19,20] The minimum CVR was based on the Lawshe table, and a score higher than 0.62 was considered.[21]

CFA was performed to evaluate the structure of the factors extracted from EFA. The fit of the indicators was used to assess the suitability of the exploratory model. To confirm the model, Root Mean Square Error of Approximation (RMSEA) less than 0.08, standardized root mean square error of approximation (SRMSEA) <0.08, Comparative Fit Index (CFI) ≥0.90, Tucker-Lewis Index (TLI) ≥0.95, and crystal normed (x2/df) <5.0 were considered.[22] Furthermore, the significance of the model coefficients test and correlation test between factors in CFA were investigated. Cronbach's alpha was used for each subdomain to determine the internal

consistency and investigate the correlation between the variables. This refers to how closely related a set of items are as a collective. SPSS version 25 was used for EFA, and Stata version 17 was used for CFA. Also, to describe the characteristics of the participants, number and percentage were used for categorical variables, and the mean and standard deviation (mean (SD)) were used for continuous variables.

Ethical considerations

The ethics committee of Tabriz University of Medical Sciences, Tabriz, Iran, approved this study (code number: IR.TBZMED.REC.1400.201). Written consent will be obtained from all participants.

Result

Participants characteristic

The study included 180 pregnant women hospitalized during labor between October 2021 and July 2022. The mean age (SD) of the participants was 29.43 (6.17) years, and the majority of them (93.30%) were homemakers. Table 1 presents more socio-demographic characteristics of the participants.

Face and content validity

Regarding face validity, all items were described as appropriate, clear, and easy, receiving a minimum score of 1.50. Also, they obtained the minimum acceptable amount of CVI and CVR in evaluating the content validity of all the items. The CVI for the scale (S-CVI) was 0.96, and the CVR for the questionnaire was 0.97 [Table 2].

Reliability

Cronbach's alpha coefficient was 0.72 for factor 1, 0.66 for factor 2, and 0.65 for the whole questionnaire, indicating the desired and acceptable internal consistency.

Construct validity

In CFA, the x^2/df index was 1.58, and the RMSEA index was 0.058, which confirmed the model's validity. Also, the TLI and CFI fit indices were greater than 0.90. As a result, this model has achieved a favorable level of fit, and accordingly, their factor structure can be confirmed. All coefficients of CFA were significant. A path diagram with standard coefficients of CFA is presented for the conceptual model considered in Figure 1. Construct validity was confirmed based on EFA and CFA.

Discussion

The present study investigated the psychometric properties of the specific anxiety questionnaire during labor, demonstrating that the Persian version is reliable and valid.

Cronbach's alpha coefficient was 0.72 for factor 1, 0.66 for factor 2, and 0.65 for the whole questionnaire,

Table 1: Characteristics of the study participants (*n*=180)

Characteristics	*n* (%)
Age (Years)*	29.43 (6.17)
Education	
Intermediate or below	42 (23.33)
Diploma and High School	100 (55.56)
University	38 (21.11)
Job	
Housewife	168 (93.33)
Employee	12 (6.67)
Income	
Not at all sufficient	51 (28.33)
Relatively sufficient	112 (62.22)
Completely sufficient	17 (9.45)

*The numbers were reported as mean (standard deviation)

Table 2: The impact score, CVI*, and CVR for questions (*n*=10 expert)**

Items	Impact score	CVI	CVR
I am afraid of being alone during delivery	4	1	1
I am currently tired	4	0.90	0.80
I am afraid that my baby may be harmed during delivery	4	1	1
I feel weak	4	0.80	1
I am concerned that I may be harmed during delivery	4	1	1
I feel like crying/I can cry at any time	4	1	1
I think of my baby and become very happy	4	1	1
When I have labor pain, I think that delivery is approaching, and I feel good	4	1	1
The birth process is worth it because I will be holding my baby in my arms	4	1	1

*CVI: Content validity index,**CVR: Content validity ratio

indicating acceptable internal consistency. In the study of Durat *et al*.,[15] Cronbach's alpha coefficient for the entire questionnaire was 0.77.

In this study, the amount of RMSEA was 0.058, which was 0.079 in the original version of the study.[15] Regarding psychometric studies, the RMSEA fit index was less than 0.8, indicating a satisfactory fit model.[22] Other fit indicator values also showed a good model fit.

The AASPWL questionnaire, with two subdomains, "birth process" and "motherhood constellation," had good validity. The birth process includes concerns related to the birth process, such as fear of harm to the baby or mother. The motherhood constellation covers the mother's concerns about the survival and growth of her child, proper bonding between mother and child, and rearrangement of the mother's character starting with pregnancy.[15]

Although questionnaires such as the Beck and VAS have been used in studies to determine mothers' anxiety, screening or determining anxiety in labor using scales
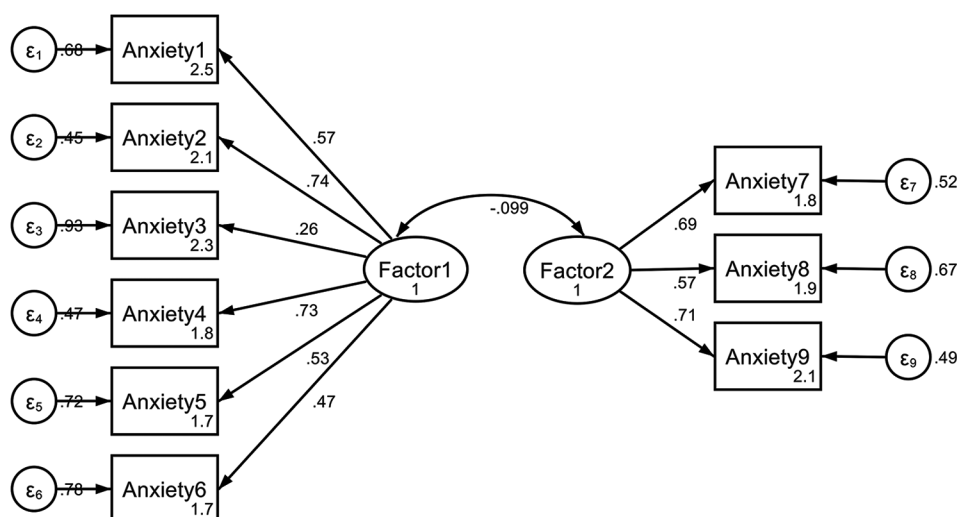
Figure 1: CFA factor loading of the AASPWL. All factor-item relationships were significant

developed for the general population is not appropriate for various reasons, partly because of the unique nature of pregnancy and labor.[15,23] Compared to other anxiety assessment tools, it seems that the AASPWL questionnaire is suitable for mothers in childbirth because it has questions concerning the mother and infant and also because of the shortness and small number of questions.[15]

Comparing this questionnaire to the Beck Anxiety Inventory (BAI) in the Durat *et al.*[15] study, it is clear that this questionnaire has been successful in assessing maternal anxiety in labor.

Based on the findings of this study, the AASPWL can be used by researchers and the childbirth team as a reliable and valid tool for determining the anxiety levels of women in labor. An accurate and timely diagnosis of women's anxiety during labor helps to perform the necessary midwifery care and can be effective in the mother's positive childbirth experience.

One of the strengths of this study is that it is the first investigation of the psychometric properties of the AASPWL in Iran. Due to the exclusion of women with high-risk pregnancies and psychological problems, the results of this study cannot be generalized to them, and it can be mentioned as a limitation of the present study.

Conclusion

The results showed that the AASPWL was a valid and reliable instrument for assessing the anxiety levels of women in labor. Numerous studies have been used to determine the anxiety and stress of pregnant women, but there has been no specific tool aimed at pregnant women in labor. Due to the severe pain of labor for women, the nine-item AASPWL short questionnaire can be a good screening tool compared to other general tools available. Future studies with a larger sample size and conducting a psychometric evaluation of this scale in different contexts will be beneficial.

Conflicts of interest

Nothing to declare.

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