Psychometric properties of the Farsi version of the women’s perceptions of vaginal examination during labor questionnaire

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Abstract

Background: Vaginal examination is the essential part of obstetric care in women’s life. Although the assessment of women’s perceptions of vaginal examination is important, no appropriate instrument in Farsi is available. Therefore, the present study was conducted to evaluate validity and reliability of the Farsi version of the women’s perceptions of vaginal examination during labor questionnaire. Materials and Methods: This cross-sectional study was carried out with 350 women who had vaginal childbirth between December 2016 and May 2017. The women were asked to fill out the demographic characteristics’ form and the women’s perceptions of vaginal examination during labor questionnaire. Construct validity, internal consistency, and stability of the questionnaires were evaluated using confirmatory factor analysis, calculation of the Cronbach’s alpha coefficient, and Spearman-Brown correlation coefficient, respectively. The SPSS (Statistical Package for the Social Sciences) v. 21 and LISREL (linear structural relations) 8.80 were used for the data analysis. Results: Confirmatory factor analysis indicated that the Farsi version of the women’s perceptions of vaginal examination during labor questionnaire had appropriate structure. The Cronbach’s alpha coefficient of the questionnaire was reported as 0.76. The Spearman–Brown correlation coefficient also showed an appropriate test–retest reliability. Conclusion: Validity and reliability of this questionnaire can appropriately measure the women’s perceptions of vaginal examination during labor among Iranian women.

Keywords: Labor, psychometric properties, vaginal examination, women’s perception

Introduction

Vaginal examination is an essential part of obstetrics and gynecology care. It is considered the gold standard for the assessment of labor progression. Since most women experience vaginal examination in their life, it should be conducted in such a way that women have a pleasant experience with it. However, it is believed that most women are vulnerable during vaginal examination. Besides physical discomfort, the psychological damage that women experience during vaginal examination is the exposure of most private parts of the body and losing the control of the body, the feeling of embarrassment about being undressed, and fear of pain and concern about genital hygiene and vaginal odor. Such feelings and negative experiences mainly occur when the examiner is male. The women’s awareness about vaginal examination can influence the success of vaginal examination by midwives.

Other factors affecting women’s perceptions of vaginal examination are their age, level of education, history of...
The study of Lai and Levy showed that women felt pain and embarrassment in the lithotomy position during vaginal examination. However, they accepted and understood it as a normal process during labor. Hassan et al. showed that 94% of women found vaginal examination as a useful health-care intervention, because it facilitated the childbirth process. Accordingly, contradictory results have been reported about women's perceptions of vaginal examination during labor in various studies.

The existence of appropriate measurement tool is required to ensure validity and reliability of the study's results. There is a need to design a new instrument or adapt available questionnaires whose validity and reliability are verified. The evaluation of psychometric properties and the cultural adaptation of instruments help researchers to ensure that available tools can be used in different societies and can appropriately measure the same concepts. If the instrument has acceptable psychometric properties, the interpretation power of the research findings is enhanced. There is no Farsi version and culturally adapted questionnaire for the assessment of women's perceptions of vaginal examination during labor. Some phrases and concepts in this instrument should be rephrased, because of cultural–contextual differences. Therefore, the present study was conducted to evaluate validity and reliability of the Farsi version of the women's perceptions of vaginal examination during labor questionnaire.

Materials and Methods

Study design

This was a methodological cross-sectional study, which studied the psychometric properties and cultural adaptation process of the women's perceptions of vaginal examination during labor questionnaire developed by Lewin et al.

Sample size

Samples collected from this study were of women aged between 15 and 45 years. The convenience sampling method was used to recruit 350 women who had vaginal childbirth in a hospital in an urban area of Iran from December 2016 to May 2017. Inclusion criteria were lack of infant's birth defects, ability to read and write in Farsi, no hepatitis and AIDS and any illness that causes pain in the perineal and vaginal areas, no high-risk pregnancy, and the gestational age ≥37 weeks. The minimum sample size was 200 individuals but in the current study, 350 women were recruited to increase the precision of data analysis.

Ethical consideration

The Institutional Review Board of the Iran University of Medical Sciences (decree code: IR.IUMS.REC.1395.9411373005) approved the research’s project. The aim of this study was described to the participants. In addition, they were ensured of confidentiality in the study process. They also gave verbal informed consent for voluntary participation in this study.

Measurements/Instruments

The demographic variables' form had questions about age, education level, marital status, occupation, income, and ethnicity. The original version of the questionnaire was consisted of 20 items with a 5-point Likert scale (strongly agree = 5, agree = 4, neither agree nor disagree = 3, disagree = 2, strongly disagree = 1). Negative statements including 5, 10, 13, 14, 15, 16, 17, 19, and 20 were scored from 1 = strongly agree to 5 = strongly disagree, whereas positive statements including 1, 2, 3, 4, 6, 7, 8, 9, 11, 12, and 18 were scored from 5 = strongly agree to 1 = strongly disagree. The total score of the questionnaire ranged from 20 to 100 with increasing the score indicating a positive perception. The questionnaire was filled out by the women 24 h after childbirth. Face and content validities of the questionnaire were assessed using a pilot test with 16 women and the opinions of 4 experienced midwives, respectively. The Cronbach's alpha coefficient for the whole scale was reported as 0.86.

Data collection method

Translation, face, and content validity

The women's perception of vaginal examination during labor questionnaire was translated using the forward–backward method. It was translated by two individuals who had enough experiences in English language and were familiar with health-care terms. Next, two experts translated the instrument back to English. The researchers and translators compared the English backward translation and the original one. After a careful review and cultural adaptation, a few changes were made to provide the final version. Validity of the instrument was assessed through face, content, and constructs' validity methods.

For qualitative face validity, 12 participants filled out the questionnaire and provided feedbacks on sentences and phrases, which led to some modifications. For instance, items 2, 4, 12, and 17 were revised for better understandings by the participants.

In addition, an expert panel consisting of 12 specialists from Iran University of Medical Sciences was asked to assess the questionnaire for qualitative content validity. The questionnaire was edited according to their comments.

Sampling was performed with 30 women to calculate the Cronbach's alpha coefficient and also the correlation between items. The alpha coefficient greater than or equal to 0.70 and the correlation between items above 0.3 were considered acceptable. According to the result, some items were modified and edited. Criterion validity was not evaluated, because no other instrument was available to compare with women's perceptions of vaginal examination during labor questionnaire. In this study, confirmatory factor analysis (CFA) was conducted to confirm construct validity.

CFA was performed using the estimation of weighted least squares to assess how well models were fit to observed data.
The asymptotic covariance matrix was used as a weighted matrix and the input matrix was considered the covariance matrix of data.\(^{12-15}\) \(\chi^2/\text{df} < 5\), root mean square error of approximation <0.08, and standardized root mean square residual <0.1, and also, comparative fit index, goodness of fit index, adjusted goodness of fit index, normed fit index, nonnormed fit index >0.90 were used for data analysis as fit indices and their acceptable values.\(^{15}\)

**Reliability**

Reliability of the questionnaire was evaluated using internal consistency and stability methods. The internal consistency was estimated using the calculation of the Cronbach’s alpha coefficient. Values greater than or equal to 0.70 were considered acceptable. Using the test–retest approach, the stability of the questionnaire was measured. The Spearman coefficient over a random sample of women was calculated. Therefore, 30 women filled out the questionnaire twice within a 2-week interval. The Spearman coefficient greater than or equal to 0.70 was considered satisfactory.

**Data analysis**

The IBM© SPSS© Statistics v.21 (IBM©Corp., Armonk, NY, USA) and LISREL v. 8.80 (Scientific Software International Inc., 2007) were used for statistical analysis. \(P < 0.05\) was considered statistically significant.

**Results**

**Samples’ characteristics**

All women participating in this study answered all questions. The average (SD) age of the women was 26.66 ± 5.65 years. Their age range was 15–41 years. About 51.7\% (\(n = 181\)) of the women had high school and diploma education degree. The highest frequency of birth was related to nulliparous women. The mean (SD) frequency of vaginal examination was 6.99 (2.52) ranging from 1 to 15 times [Table 1].

**Validity**

Validity of the questionnaire was confirmed in terms of qualitative face and content validity. CFA was used to evaluate the model designed based on original instrument. The model had reasonably good fit indices as shown in Table 2. According to this model, standardized factor loadings ranged from 0.30 to 0.97 with all items demonstrating moderate-to-strong factor loadings (above 0.30). This revealed that the Farsi version of the women's perceptions of vaginal examination during labor had an appropriate structure [Figure 1].

**Reliability**

Cronbach’s alpha coefficients for the instrument were calculated for the measurement of internal consistency. The Cronbach’s alpha coefficient for the total instrument was reported as 0.76. The value of the test–retest method using the calculation of the Spearman–Brown coefficient was reported as 0.79 (\(P = 0.001\)).

**Discussion**

Vaginal examination is a common experience in women’s life that women experience once in their life especially during labor. A few researcher-made instruments are available to assess women’s perceptions of vaginal examination during labor.\(^{14,16}\) Only one instrument\(^{19}\) evaluated women’s perceptions of vaginal examination. Therefore, a valid and reliable instrument was required to measure women’s perceptions of vaginal examination during labor in Iran. Given the English language of the original instrument developed by Lewin, cultural adaptation and evaluation of psychometric properties of the Farsi version of this instrument were performed in a population of Iranian females. The questionnaire was frequently modified during the process of translation, the face, and content validity assessment in terms of simplicity, fluency, and compliance with cultural and social norms. The Farsi version of this questionnaire as a reliable and valid tool can be used in health-care studies.

In the present study, validity of this questionnaire was assessed in terms of qualitative face and content validity. Criterion validity was impossible, because no instrument was available to evaluate women’s perceptions of vaginal examination. For face validity, 12 participants filled out the questionnaire and an expert panel of 12 specialists assesses the questionnaire for qualitative content

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**Table 1: The demographic characteristics of the samples**

| Characteristics                  | Results   |
|----------------------------------|-----------|
| Age (years), mean (SD)           | 26.66 (5.65) |
| Education level no. (%)          |           |
| Primary school                   | 42 (12)   |
| Secondary school                 | 82 (23.4) |
| High school and diploma          | 181 (51.7) |
| University education             | 45 (12.9) |
| Occupation no. (%)               |           |
| Housewife                        | 341 (97.4) |
| Employed                         | 9 (2.6)   |
| Marital status no. (%)           |           |
| Married                          | 349 (99.7) |
| Separated                        | 1 (3)     |
| Economic status no. (%)          |           |
| Low                              | 81 (23.1)  |
| Middle                           | 247 (70.6) |
| High                             | 22 (6.3)  |
| Ethnicity no. (%)                |           |
| Fars                             | 122 (34.9) |
| Tork                             | 171 (48.9) |
| Lor                              | 39 (11.1)  |
| Kord                             | 15 (4.3)   |
| Other                            | 3 (0.9)    |

**Table 2: The fit index CFA of women’s perceptions of vaginal examination during labor questionnaire**

| \(\chi^2\)   | df   | \(\chi^2/\text{df}\) | SRMR | RMSEA | CFI  | NNFI | GFI  | AGFI |
|--------------|------|----------------------|------|-------|------|------|------|------|
| 663.24       | 170  | 3.9                  | 0.06 | 0.016 | 0.944| 0.93 | 0.929| 0.911| 0.945|

All items’ relationships were statistically significant (\(P<0.001\))
validity. CFA was used to confirm the instrument’s construct validity. For the English version of this questionnaire, face and content validities were assessed using a pilot test with 16 women and perspectives of 4 experienced midwives, respectively. In the Lewin’s study, nothing was reported regarding construct validity.

In the Panamanian version of this instrument, Bonilla-Escobar et al. [19] used the data analysis of the Ortega’s study [17] to assess validity and reliability of the instrument. However, no explanation about the details of face and content validity was presented. In Bonilla-Escobar’s study, criterion validity was not evaluated, because no instrument was available to evaluate women’s perceptions of vaginal examination. In the Panamanian version of this instrument, exploratory factor analysis was performed for construct validity leading to a five-factor solution as follows: approval (six items), perception (five items), rejection (three items), consent (four items), and stress (two items). Cronbach’s alpha for internal consistency showed an index less than 0.5 possibly because of the number of items. Bonilla-Escobar et al. through the analysis of each item and their assignments to subscales increased the Cronbach’s alpha coefficient when item 2 was developed. Finally, the internal consistency of this questionnaire was reported as 0.75. In the current study, none of the items was deleted, because each item was scored appropriately.

Reliability of the questionnaire was measured using internal consistency and stability methods. The internal consistency was measured using the calculation of the Cronbach’s alpha coefficient. The Cronbach’s alpha coefficient was reported as 0.76. Using the test–retest method, the stability of the questionnaire was confirmed. The reported level of satisfaction in internal consistency was almost similar to the original version. Reliability of the English version of the questionnaire was also satisfactory. In the Panamanian version of the questionnaire, internal consistency was evaluated by the calculation of correlations between items. Of the 20 items, 11 items showed an appropriate correlation (>0.3). In addition, the internal consistency using the calculation of the alpha Cronbach’s coefficient was reported as 0.736. For internal consistency, the contribution of each item to the scale using the Cronbach’s alpha was assessed to find changes in the scale when an item was removed. For instance, the Cronbach’s alpha value was increased when item 2 was deleted. Although this increase was not considered significant, this item was included because of its importance. In the Panamanian version of this questionnaire, the alpha value varied from 0.698 to 0.749. This value varied from 0.737 to 0.785 in the present study. For reliability, in the Panamanian version of this questionnaire, the Cronbach’s alpha coefficient indicated an appropriate structure of this questionnaire.

The instrument of this study can be used by health-care providers to precisely evaluate the Iranian women’s perceptions of vaginal examination during labor. The validated instrument not only allows health-care staff to identify women’s perceptions, but also it allows health-care staff to explore factors related to the quality of health-care services. [18] Further studies are needed for developing interventions that prevent women’s negative perceptions of vaginal examination during labor, improve their awareness, and avoid complications during labor. Identification of women’s perspectives improves women’s involvement in decision-making. [19] In a study that examined the experiences of Palestinian women during vaginal examination, women’s experiences improved obstetrics health-care services, reduced the number of health-care providers performing the procedure, and reduced women’s discomfort. [20]

Lack of criterion validity and convenience sampling method may have influenced the results of the current study. In addition, this study was conducted in a referral hospital in an urban area of Iran, which could lead to a potential reduction of selection bias. For reducing the data collection bias, the questionnaire was filled out for all women in the same time and environment, 24 h after childbirth. In this study, explanations and justifications were provided to the samples to ensure the accuracy of data collected from the participants. In addition, the Lewin’s study [5] was conducted with 104 primiparous women in multicentered settings in the United Kingdom. The present study was carried out only in one hospital in an urban area of Iran. Most participants were married and housewives and lived in neighborhoods surrounding the hospital. The majority of them had a similar socioeconomic status. Since demographic characteristics and women’s perceptions of vaginal examination can be influenced by the location of sampling, more studies are needed using a multicentered sampling approach in different regions and cultures. Qualitative studies are required to explore Iranian women’s perceptions of vaginal examination for designing appropriate instruments to the Iranian culture and context.

**Conclusion**

This study investigated reliability and validity of the Farsi version of women’s perceptions of vaginal examination during labor
questionnaire. This instrument had appropriate psychometric properties and can be used for measuring women's perceptions of vaginal examination among Iranian women. Given a lack of valid and reliable instruments in accordance with the Iranian culture to measure women's perceptions of vaginal examination, the evaluation of the psychometric properties of this instrument in the Iranian culture and context was required. More research is needed to assess the psychometric properties of this instrument in other cultures and contexts.

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Conflicts of interest
There are no conflicts of interest.

References
1. Ulker K, Kivrak Y. The effect of information about gynecological examination on the anxiety level of women applying to gynecology clinics: A prospective, randomized, controlled study. Iran Red Crescent Med J 2016;18:e23864.
2. Yanikkerem E, Özdemir M, Bingol H, Tatar A, Karadeniz G. Women’s attitudes and expectations regarding gynaecological examination. Midwifery 2009;25:500-8.
3. Shepherd A, Cheyne H. The frequency and reasons for vaginal examinations in labour. Women Birth 2013;26:49-54.
4. Hassan SJ, Sundby J, Hussein A, Bjertness E. The paradox of vaginal examination practice during normal childbirth: Palestinian women’s feelings, opinions, knowledge and experiences. Reprod Health 2012;9:16.
5. Lewin D, Fearon B, Hemmings V, Johnson G. Women’s experiences of vaginal examinations in labour. Midwifery 2005;21:267-77.
6. Dixon L, Foureur M. The vaginal examination during labour: Is it of benefit or harm?. New Zealand College of Midwives J 2010; 42:21-6.
7. DeMaria AL, Hollub AV, Herbenick D. The Female Genital Self-Image Scale (FGSIS): Validation among a sample of female college students. J Sex Med 2012;9:708-18.
8. Herbenick D, Schick V, Reece M, Sanders S, Dodge B, Fortenberry JD. The Female Genital Self-Image Scale (FGSIS): Results from a nationally representative probability sample of women in the United States. J Sex Med 2011;8:158-66.
9. Lai CY, Levy V. Hong Kong Chinese women’s experiences of vaginal examinations in labour. Midwifery 2002;18:296-303.
10. Rassuli M, Yaghmaie F, AlaviMajd H. Psychometric features of the “Youth Hope Scale” in adolescents living in boarding schools. Payesh 2010;9:199-204.
11. Tabachnick BG, Fidell LS. Using multivariate statistics; (5th ed.). Boston, MA: Allyn & Bacon/Pearson Education; 2007.
12. Bartlett MS. A note on the multiplying factors for various $\chi^2$ approximations. Journal of the Royal Statistical Society. Series B (Methodological) 1954;16:296-8.
13. Bentler PM. Comparative fit indexes in structural models. Psychol Bull 1990;107:238-46.
14. Bentler PM, Bonett DG. Significance tests and goodness of fit in the analysis of covariance structures. Psychol Bull 1980;88:588-606.
15. Burns N, Grove SK. The practice of nursing research. Conduct, critique and utilization. St. Louis, Mo.: Elsevier/Saunders publication; 2005. p. 123-80.
16. Swahnberg K, Wijma B, Siwe K. Strong discomfort during vaginal examination: Why consider a history of abuse? Eur J Obstet Gynecol Reprod Biol 2011;157:200-5.
17. Ortega C, López C, Romani F, Correa R. Percepción y satisfacción de las usuarias de hospitales públicos de Ciudad de Panamá sobre el tacto vaginal durante el trabajo de parto. Revista Peruana de Epidemiología 2009;13:1-7.
18. Broadmore J, Carr-Gregg M, Hutton J. Vaginal examinations: Women’s experiences and preferences. N Z Med J 1986;99:8-10.
19. Bonilla-Escobar FJ, Ortega-Lenis D, Rojas-Mirquez JC, Ortega-Loubon C. Panamanian women’s experience of vaginal examination in labour: A questionnaire validation. Midwifery 2016;36:8-13.