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Development and Psychometrics of Perceived Experiences of Natural Vaginal Childbirth in Iranian Primiparous Women Questionnaire

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Abstract
Objectives: Delivery is a different experience in Iran. Delivery rooms are not private, women are not accompanied by their husbands or mothers, and the number of midwives per shift is not enough. Midwives also have a lot of responsibilities including labor control, doing delivery, and filling out the digital forms. The aim of this study is to develop psychometrics of perceived experiences of natural vaginal childbirth in Iranian primiparous women.
Materials and Methods: This cross-sectional study was done in the postpartum unit of Taleghani hospital (Arak, Iran). In the design stage, questionnaire items were extracted from a comprehensive review of qualitative and quantitative studies and similar tools. A 25-item questionnaire was then designed, validated, and distributed among 400 primiparous women (selected via simple random sampling). The filled questionnaires were used for factor analysis. The validity of the tool was then found using face and content validity. Its reliability was also confirmed by internal consistency.
Results: The questionnaire to assess the perceived experiences of natural childbirth in primiparous women contained six domains including privacy (6 items), mother's experience of childbirth (5 items), mother's experience of midwife's behavior (5 items), midwife's support (3 items), experience of childbirth pain (3 items), and understanding mother's expectations of the personnel (3 items). The internal consistency of the questionnaire was calculated as 0.72.
Conclusions: Valid and reliable tools like the one designed in the current research can facilitate the evaluation of services provided in delivery rooms and help women have a more pleasurable experience of childbirth.
Keywords: Natural childbirth, Postpartum, Psychometric, Vaginal delivery

Introduction

A vaginal delivery rate of about 50% has been reported in Iran. Statistics show that more than half of the pregnant women in Iran choose cesarean delivery (1). The mode of childbirth has been a strong predictor of childbirth satisfaction (2,3). A various study examined the factors affecting childbirth experiences and satisfaction in women and showed that fear (4), personal expectations, lack of support from care provider during childbirth, the quality of the relationship between the parturient and the care provider and lack of the mother's involvement in the decisions, lack of support during labor and lack of attention to the use of painkiller during labor are factors affecting labor experience and satisfaction (5,6). Studies conducted to assess women's experience of childbirth have encouraged researchers to develop tools for examining childbirth experiences so as to enable the identification of high-risk mothers in terms of mental health problems such as postpartum depression and post-traumatic stress disorder (PTSD), and to provide them with the needed

support (7-10). These tools can also enable childbirth and labor policy-makers to identify the factors obviating negative experiences of childbirth and thus facilitate a pleasant childbirth experience for mothers through educational and structural interventions.

Previous studies showed that researchers have been interested in developing a tool for assessing childbirth experiences (9-11). For instance, Dencker et al developed a childbirth experience questionnaire in 2010 for mothers in need of postpartum support and counseling. They conducted a factor analysis of four factors and their role in mothers' satisfaction with childbirth including personal capacity, specialist support, perceived safety and mother's participation (9). In another study, a localized tool called "women's perceptions of the childbirth experience" was developed for Italian women that was scored based on a 6-point Likert scale from 'totally agree' to 'totally disagree', in which higher scores indicated more negative experiences. This questionnaire consisted of three structural factors including labor and childbirth (9 items),

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perceived control (8 items) and perceived change (7 items) (10). The "perceived change" factor of this questionnaire examined the effect of body image during pregnancy on childbirth. Janssen and Desmarais also developed a labor experience questionnaire mainly focused on the early stages of labor rather than the progress of labor into childbirth; their 26-item questionnaire examined two factors, namely the sensory experience and the nursing care experience (11).

Although these questionnaires examine mothers' experiences of childbirth to a certain degree, a research suggests that mothers' perceptions of childbirth are associated with environmental and social factors (12).

In Iran, delivery rooms are inappropriately designed, and women give birth alongside one another, and consequently, privacy is not observed. Furthermore, the number of midwifery personnel in each shift is insufficient, and thus midwives have many responsibilities including labor control, performing delivery, filling out computer forms, and writing reports on patient's medical record (13). Given the cultural differences, the fact that maternity wards in Iran have not been built according to international standards and the shortage of midwives, the researchers decided to develop an instrument for the experience of normal vaginal delivery in Iranian mothers.

Materials and Methods
This methodological study was conducted according to the following stages:

First, an extensive search was conducted using databases such as PubMed, Science Direct, Ovid, and Google Scholar, and questionnaires designed on the subject were reviewed. Each database was searched using keywords: "experience of labour", "childbirth", "satisfaction", "natural delivery", "cesarean section", "mental health", " tool", "instrument", "scale", and "questionnaire". The search encompassed the period between 1990 and 2014 using the aforementioned keywords and Boolean operators 'AND', 'OR' and 'Not'. The first database search yielded 353 articles. After reviewing the article abstracts, 30 relevant articles were selected but only 3 discussed tools were developed to measure women's experiences of vaginal childbirth (9-11)

Then, a qualitative study was conducted in relation to the experiences of vaginal delivery in mothers who had given birth in the last 6 hours and had been hospitalized in the postpartum unit. At this stage, samples included 12 mothers who had entered interviews. Mothers were asked to describe their experiences and thoughts about vaginal delivery, behavior of the personnel, and the labor environment from the moment they entered the labor room in semi-structured interviews.

All the women who had given birth were Iranian and primiparous with a mean age of 21 ± 1.7 years. The majority of the women had a high school diploma (70%, n = 9). The women had a vaginal childbirth without the use of forceps and vacuum and were selected through purposive sampling and their consent for participation in the study was obtained.

All the individual interviews (12 individual interviews) were recorded and then transcribed. Interviews were continued until data saturation when no new data or codes emerged. A content analysis was done. After coding, concepts were categorized as fear of labor and the unknown, fear of losing the baby, fearing bodily harm, fearing death and labor pain, in 3 subcategories, namely personnel's support (effective relationship with the parturient, acting with respect and respecting privacy), the labor environment (the color of the walls, the personnel's clothing, the labor room environment) and positive emotions (the feeling of pride, the feeling of becoming a mother and the feeling of strength).

The extracted codes and categories were checked with the interviewed women, 95% of whom agreed with the perceived concepts and categories. For instance, "*I wished the midwife would tell me about the progress of my labor after each examination*", which fell into the subcategory of 'the midwife's relationship with the parturient' and the category of 'the midwife's support', or, for example, "*It'd have been better if they'd put me in a less crowded room*", which fell into the subcategory of "labor room environment" and the category of "labor environment". At this stage, the final question bank contained 53 items.

Then, the validity of the tool was determined using face, content, and construct validity methods.

To determine the content validity ratio, 5 experts in obstetrics (1), midwifery (2), and health education and psychology (1) were requested to assess each item according to a 3-point Likert scale (essential, beneficial but not essential, and not essential). Based on Lawshe's table, the items with content validity ratio higher than 0.99 were retained. The experts were selected based on their work experience, their role in the delivery room, and research field.

A total of 17 items were eliminated at this point. The remaining 36 items were given to 7 professors in midwifery (4), and reproductive and gynecology health (3) (different from experts in the previous stage) to assess relevance, clarity and simplicity of each item based on Waltz-Bausell content validity index using a 4-point Likert scale (between 0-4 score). Items with relevance and clarity and simplicity greater than 0.79 were maintained and 11 items were eliminated.

Next, after obtaining informed written consent, 10 postpartum women were given the questionnaire to decide if items were understandable to them. Mothers explained what each item meant to the researcher, so that unclear statements or words could be identified.

At this stage, mothers and the researcher reached consensus about all items, and no item needed modification. The final stage contained 25 items.

The reliability of the tool was determined using internal consistency through Cronbach α. Following

factor analysis, the 25-item questionnaire of experience of primiparous women was issued to 100 primiparous women, and Cronbach α was calculated for each item and for the whole questionnaire.

In this study, construct validity was determined through exploratory factor analysis. To this end, the questionnaire was issued to 400 women who were randomly selected from the study population in the postpartum ward of the Taleghani maternity referral hospital between July and October 2013.

The inclusion criteria in this study included being Iranian, being primiparous, being 18 years and older, and having a term fetus. Women with acute or chronic diseases and twins were excluded.

Women were asked to answer the items of labor experience questionnaire on a 5-point Likert scale from totally agree to totally disagree. Statistical analysis was performed using SPSS software version 20.0.

Results

Mothers' mean age was 23 ± 1.8 years. Moreover, 26% of the mothers (n = 104) had elementary school education, 26% (n = 104) attended junior high school and 38% (n = 152) had high school education and rest of them (10%) (n = 40) had university degree. All mothers underwent natural vaginal delivery (NVD) without using vacuum or forceps. Analgesics were not used to relieve labor pain. The mean gestational age was 39 ± 1.2 weeks. Almost all mothers (98%) were housewives and 2% were employed.

Following exploratory factor analysis, 3 main outputs were provided as follows: Output 1 provided the value of Kaiser-Meyer-Olkin (KMO) index as 0.783. Hence, the selected sample size was sufficient for performing factor analysis. Moreover, Kruit-Bartlett's test also confirmed the suitability of factor analysis for identifying the structure of factor model at $P = 0.0001$ and implied the presence of relationships between variables, which was verified through factor analysis.

Scree plot (Figure 1) showed that 6 factors with the predictive power of % 57.17 supported total variance of perceived experiences of childbirth (Table 1). The cut-off point of 0.4 was considered the least factor loading to keep the items.

The highest factor loading of each item on each factor (bold factors) was considered the factor covering that item (Table 2). A total of 25 items in the form of 6 factors were found for the 25-item questionnaire (Table 3).

Internal consistency was assured using Cronbach α of 0.72 for the questionnaire.

Discussion

In this study, perceived experiences of natural childbirth (PENCQ) in primiparous women was designed and developed with 25 items in 6 domains. The 6 domains included privacy (6 items), mother's expectation of childbirth (5 items), midwife's behavior (5 items), midwife's
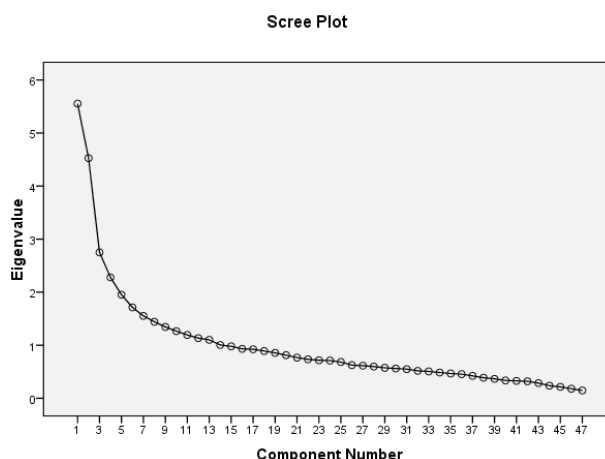

Figure 1. Scree Plot of Factors Explaining Factor Construct of Labor Experience Scale After Assessment of Internal Consistency.

Table 1. Percentage of Variance of the First 6 Factors of Labor Experience Scale after Assessment of Internal Consistency

Factor	Percentage Variance of Factor	Accumulative Percentage of Overall Variance
1	12.88	12.88
2	11.64	24.13
3	8.83	32.96
4	8.29	41.25
5	8.08	49.33
6	7.84	57.17

support (3 items), childbirth pain (3 items), and mother's expectations of the personnel (3 items). The scoring of the designed tool was based on a 5-point Likert scale.

The present study is similar to the study by Dencker et al. Dencker et al designed "labor experience scale", which assesses women's understanding of the first labor experience, with domains including own capacity, professional support, perceived safety, and participation. Items are scored according to a 4-point Likert scale (9). They examined the experience of care of the spouse in their study too; however, since labor rooms in Iran are still not suitable for the presence of spouses and since there are no private labor rooms in hospitals of the country, the present study was unable to examine such experiences (9). In this study 4 factors comprised 28%, 15%, 6%, and 5% of variance, respectively but in the present study, factors 1 to 6 accounted for 12.88%, 11.84%, 8.83%, 8.29%, 8.08% and 7.84% of the variance (9).

Bertucci et al localized a questionnaire titled "Assessing the perception of the childbirth experience in Italian women", which was designed with 3 factors and 24 items. These 3 factors accounted for 38.8% of the total variance. However, in our study, 57.17% of the variance of the whole questionnaire was explained by these 6 factors. Mean internal consistency was found to be 0.80 using Cronbach α (10) but in the present study, it was 0.72. In addition, Items with a minimum factor loading of 0.35 were used in the questionnaire (10) but in this study, minimum

Table 2. Varimax Factor Loading of Items of Labor Experience Scale Using Principal Components and Varimax Analysis Methods

Item Number	Factor					
	1	2	3	4	5	6
It would have been better if I was in a less crowded room	0.759					
Crowded delivery room frustrated me	0.753					
Personnel paid less attention to me in crowded labor room	0.729					
I had no privacy in the labor room	0.691					
Having several deliveries in one room was not a good experience for me	0.554					
Vaginal examination in presence of others was embarrassing	0.549					
Kind words calmed me		0.816				
Insulting words negatively affected my tolerance		0.797				
Talking to personnel before any intervention made me feel good		0.606				
Talking to midwife made me calm		0.541				
I wished midwife would let me know about progress of labor after each examination		-0.476				
Pain made me feel more like a mother						
I felt good when I heard fetus heart			0.663			
I felt satisfied when deliverer told me about baby's health			0.653			
I felt like a mother when the baby came out			0.628			
I felt so good when I holding my baby in my arms after labor			0.500			
Midwives had not given me adequate pain control training			0.462			
Labor pain cannot be compared to anything				0.782		
During labor I felt my back and body were tearing apart				0.750		
I died of pain and came back				0.743		
I expected the personnel to pay more attention to my needs					0.830	0.742
I expected respect from the personnel					0.704	0.729
I expected the personnel to make an effort to clean me up					0.493	0.633

Table 3. Final Items and Domains of Primiparous Women's Labor Experience Scale

Domains	Statements
1- Privacy	It would have been better if I was in a less crowded room Crowded delivery room frustrated me Personnel paid less attention to me in crowded labor room I had no privacy in the labor room Having several deliveries in one room was not a good experience for me Vaginal examination in presence of others was embarrassing
2- Mother's experience of midwife's behavior	Kind words calmed me Insulting words negatively affected my tolerance Talking to personnel before any intervention made me feel good Talking to midwife made me calm I wished midwife would let me know about progress of labor after each examination
3- Mother's experience of labor	Pain made me feel more like a mother I felt good when I heard fetus heart I felt satisfied when the midwife told me about baby's health I felt like a mother when the baby came out I felt so good when I held my baby in my arms after labor
4- Midwife's support	Midwives had not given me adequate pain control training I expected the personnel to pay more attention to my training needs I expected the personnel to pay more attention to my physical needs
5- Labor pain experiences	Labor pain cannot be compared to anything During labor, I felt my back and body were tearing apart I died of pain and came back
6- Mother's expectation from personnel	I expected the personnel to pay more attention to my training needs I expected respect from the personnel I expected the personnel to make an effort to clean me up

acceptable factor loading was considered 40%.

Another study was conducted by Truijens et al which contains 25 items, including two factors for the part assessing the experience of pregnancy and only one factor for the part assessing the experience of childbirth (14), which is inconsistent with the present study. We extracted 6 factors for women experience in labor and delivery room.

For every individual, childbirth is a complex, multifaceted, mental experience associated with healthy infant outcomes and stages of birth (15). In this experience, women's emotional and psychological elements are often overlooked, and focus is rather on elements such as quality of care, intervention, and mortality.

The questionnaire designed in this study can contribute to women's understanding of events in childbirth, through which care providers can determine various and multidimensional aspects of the experience of childbirth. Moreover, it addresses childbirth experience more comprehensively compared to similar foreign tools (most of which also considered satisfaction), and it is the first valid and reliable tool in Iran that can be used by health researchers.

Given items used, the first factor was named "respect privacy". Mothers prefer a calm and private place for their labor and expect labor care and examinations performed in a completely private setting.

In a qualitative phenomenological study in Iran aiming to explain women's experience of labor, privacy was extracted from interviews as one of the main concepts (15), which is similar to the present study results. Lothian asserts that in both humans and animals, catecholamine is released with fear, threat or fright during labor, making the process difficult, and thus emphasizes the importance of a safe and private setting for the parturient (16).

The second factor in our study was named "mother's experience of labor". The feeling of becoming a mother alongside the experience of pain, fetus passing through the birth canal, the good feeling of hearing the fetal heartbeat, holding the baby immediately after birth and feeling content upon hearing that the baby is healthy were some of the sensory feelings experienced by the mothers in the present study. This factor is also cited in a study by Fenwick, arguing that labor is an exciting, joyful, quick and easy process (17).

The third factor in our study was named "mother's experience of midwife's behavior".

The use of obscene words, notifying of the progress of labor and talking to the mother were some of the behaviors experienced by Iranian mothers during labor. In line with the present study, Truijens et al also extracted the factor of "personnel's behavior" from the data. Behaviors such as communication, mother's independence, training, teamwork and allowing the father's presence were among the personnel behaviors which their subjects had experienced (14). Studies have shown that mothers'

positive perception of labor is affected by characteristics of health provider, and their supportive manner, friendly and respectful behaviors (18,19).

The fourth factor in our study was named "midwife's support". Educational support and attention to physical needs were experienced by Iranian mothers in the present study. Education enables mothers to overcome many of their fears during labor such as fear of perineal injuries, postpartum sexual dysfunction and fetal death (20).

According to the findings by Lundgren and Berg, midwife's support left a lasting effect on the positive experience of labor on mothers even two years after labor (21).

The fifth factor in our study was named "labor pain". This is also cited in other studies as negative labor experience (22,23). In the present study, the experience of pain was included based on a 5-point scale from 'totally agree' to 'totally disagree'. When pain is a negative experience for mothers, pain-reducing techniques should be considered in standard childbirth care (24,25).

The sixth factor of our study was named "mother's expectations from personnel". Expecting respect, cleanliness and attention to the mother's needs were among the findings of the present study. In the questionnaire developed by Dencker et al, providers' perception of the mother's needs, informing the mother of the progress of her labor and allocating enough time to care were some of the expectations expressed by mothers (9).

Since this questionnaire is designed for primiparous women, it may not be applicable to the experiences of women in later deliveries, and it is recommended that a questionnaire be specifically designed and validated for women's experiences in multiparous women. This is the limitation of this study. In contrast, the strong point of the study is using a tool which helps childbirth policy-makers and midwives working in maternity wards to create a more pleasant childbirth environment for mothers. Using tools for assessing the experience of mothers in future studies was recommended by these researchers.

Conclusions
In this study, the questionnaire of perceived experiences of natural childbirth in primiparous women was designed and validated with 25 items and 6 domains.
Since the factors extracted in the present study are very similar to those of other studies, it appears that this tool can be used in examining the labor experiences of Iranian primiparous women.

Conflict of Interests
Authors declare that they have no conflict of interests.

Ethical Issues
Arak University of Medical Sciences approved the study (ethical code No. 91-140-13).

References
1. Sadat Z. Reasons for elective cesarean section in Iranian women. Nurs Midwifery Stud. 2014;3(3):e22502.
2. Blomquist JL, Quiroz LH, Macmillan D, McCullough A, Handa VL. Mothers' satisfaction with planned vaginal and planned cesarean birth. Am J Perinatol. 2011;28(5):383-388. doi:10.1055/s-0031-1274508
3. Mousavi SA, Mortazavi F, Chaman R, Khosravi A. Quality of life after cesarean and vaginal delivery. Oman Med J. 2013;28(4):245-251. doi:10.5001/omj.2013.70
4. Storksen HT, Garthus-Niegel S, Adams SS, Vangen S, Eberhard-Gran M. Fear of childbirth and elective caesarean section: a population-based study. BMC Pregnancy Childbirth. 2015;15:221. doi:10.1186/s12884-015-0655-4
5. Waldenstrom U, Hildingsson I, Rubertsson C, Radestad I. A negative birth experience: prevalence and risk factors in a national sample. Birth. 2004;31(1):17-27. doi:10.1111/j.0730-7659.2004.0270.x
6. Gungor I, Beji NK. Development and psychometric testing of the scales for measuring maternal satisfaction in normal and caesarean birth. Midwifery. 2012;28(3):348-357. doi:10.1016/j.midw.2011.03.009
7. Sawyer A, Ayers S, Abbott J, Gyte G, Rabe H, Duley L. Measures of satisfaction with care during labour and birth: a comparative review. BMC Pregnancy Childbirth. 2013;13:108. doi:10.1186/1471-2393-13-108
8. Ford E, Ayers S. Stressful events and support during birth: the effect on anxiety, mood and perceived control. J Anxiety Disord. 2009;23(2):260-268. doi:10.1016/j.janxdis.2008.07.009
9. Dencker A, Taft C, Bergqvist L, Lilja H, Berg M. Childbirth experience questionnaire (CEQ): development and evaluation of a multidimensional instrument. BMC Pregnancy Childbirth. 2010;10:81. doi:10.1186/1471-2393-10-81
10. Bertucci V, Boffo M, Mannarini S, et al. Assessing the perception of the childbirth experience in Italian women: a contribution to the adaptation of the Childbirth Perception Questionnaire. Midwifery. 2012;28(2):265-274. doi:10.1016/j.midw.2011.02.009
11. Janssen PA, Desmarais SL. Development and psychometric properties of the Early Labour Experience Questionnaire (ELEQ). Midwifery. 2013;29(3):181-189. doi:10.1016/j.midw.2012.05.012
12. Beigi NM, Broumandfar K, Bahadoran P, Abedi HA. Women's experience of pain during childbirth. Iran J Nurs Midwifery Res. 2010;15(2):77-82.
13. Bagheri A, Masoudi Alavi N, Abbaszadeh F. Iranian obstetricians' views about the factors that influence pregnant women's choice of delivery method: a qualitative study. Women Birth. 2013;26(1):e45-49. doi:10.1016/j.wombi.2012.09.004
14. Truijens SE, Pommer AM, van Runnard Heimel PJ, Verhoeven CJ, Oei SG, Pop VJ. Development of the Pregnancy and Childbirth Questionnaire (PCQ): evaluating quality of care as perceived by women who recently gave birth. Eur J Obstet Gynecol Reprod Biol. 2014;174:35-40. doi:10.1016/j.ejogrb.2013.11.019
15. Askari F, Atarodi A, Torabi S, Moshki M. Exploring women's personal experiences of giving birth in Gonabad city: a qualitative study. Glob J Health Sci. 2014;6(5):46-54. doi:10.5539/gjhs.v6n5p46
16. Lothian JA. Do not disturb: the importance of privacy in labor. J Perinat Educ. 2004;13(3):4-6. doi:10.1624/105812404x1707
17. Fenwick J, Hauck Y, Downie J, Butt J. The childbirth expectations of a self-selected cohort of Western Australian women. Midwifery. 2005;21(1):23-35. doi:10.1016/j.midw.2004.07.001
18. Berg M, Asta Olafsdottir O, Lundgren I. A midwifery model of woman-centred childbirth care--in Swedish and Icelandic settings. Sex Reprod Healthc. 2012;3(2):79-87. doi:10.1016/j.srhc.2012.03.001
19. Hildingsson I, Thomas JE. Women's perspectives on maternity services in Sweden: processes, problems, and solutions. J Midwifery Womens Health. 2007;52(2):126-133. doi:10.1016/j.jmwh.2006.10.023
20. Lundgren I, Berg M, Lindmark G. Is the childbirth experience improved by a birth plan? J Midwifery Womens Health. 2003;48(5):322-328. doi:10.1016/S1526-9523(03)00278-2
21. Lundgren I. Swedish women's experience of childbirth 2 years after birth. Midwifery. 2005;21(4):346-354. doi:10.1016/j.midw.2005.01.001
22. Nakano AM, Homsi Jorge Ferreira C, de Almeida AM, Gomes FA. Childbirth experience according to a group of Brazilian primiparas. Midwifery. 2012;28(6):e844-849. doi:10.1016/j.midw.2011.09.014
23. Stirparo S. Maternal Expectations, Information, and Satisfaction with Labor Analgesia. Epidural Labor Analgesia: Springer; 2015:63-71.
24. Vakilian K, Karamat A, Mousavi A, Shariati M, Ajami E, Atarha M. The effect of Lavender essence via inhalation method on labor pain. J Shahrekord Univ Med Sci. 2012;14(1):34-40.
25. Vakilian K, Davood-Abadi M, Samadi S. Effects of normal saline subcutaneous injection in low back labor pain. Koomesh. 2006;8(1):69-74.