

ORIGINAL ARTICLE

Development and Psychometric Properties of the Decision Making on the Type of Delivery Questionnaire in Iranian Women

Robab Latifnejad Roudsari¹, PhD; Maryam Zakerihamidi², PhD; Effat Merghati Khoei³, PhD; Anoshirvan Kazemnejad⁴, PhD

¹Evidence-Based Care Research Centre, Department of Midwifery, School of Nursing and Midwifery, Mashhad University of Medical Sciences, Mashhad, Iran;

²Department of Midwifery, School of Medicine, Tonekabon Branch, Islamic Azad University, Tonekabon, Iran;

³Iranian National Center for Addiction Studies (INCAS), Institution of Risk Behavior Reduction, Tehran University of Medical Sciences; Tehran, Iran

⁴Department of Biostatistics, School of Medicine, Tarbiat Modares University, Tehran, Iran

Corresponding author:

Maryam Zakerihamidi, PhD, Department of Midwifery, School of Medicine, Tonekabon Branch, Islamic Azad University, P. O. Box: 46841-61167, Tonekabon, Iran

Tel/Fax: +98 11 52245014; Email: maryamzakerihamidi@yahoo.co.nz

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ABSTRACT

Background: A tool which can help to decide on the determinants in selecting the delivery type is an effective step towards the goals of the World Health. This study aimed to develop and evaluate the psychometric properties of a scale based on Iranian culture to make decision on the type of delivery.

Methods: This is a methodological study using a questionnaire proposed by Schneider. The following steps were used to design the project. In the first step, perceptions and experiences of 45 pregnant women, postpartum women, midwives, gynecologists and non-pregnant women were determined based on interviews and observations using focused ethnography. In the second stage, the terms in the questionnaire based on qualitative study was assessed. Then, in the third stage, psychometric testing of the decision making on the type of delivery scale (DMTDS) based on the cultural concepts of decision making towards the type of delivery and its influencing factors based on focused ethnography using face validity, content validity, construct validity, internal consistency and reliability was done on 400 pregnant and postpartum women.

Results: The initially developed scale consisted of 60 items on a 5-point Likert scale, which reduced to 43 items following measurement of the face and content validity. The results of the exploratory factor analysis elicited 36 items and a seven-factor structure including motivational beliefs on vaginal delivery, social beliefs towards childbirth, motivational beliefs on cesarean delivery, personal beliefs, sources of information, catastrophic thinking and child birth experiences. Cronbach's alpha coefficient (0.80) confirmed the high internal consistency of the scale.

Conclusion: The developed questionnaire appears to be a valid and reliable tool for health care providers to measure the women's decision making towards type of delivery. Therefore, this tool can be used in the Iranian community. The scale may help the midwives and obstetricians to be aware of the women's decision regarding their choice of delivery and as a result to plan appropriately in order to reduce unnecessary cesarean sections.

KEYWORDS: Psychometrics, Decision making, Scale, delivery, Iran

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INTRODUCTION

Giving birth to a child is one of the blessings for human population expansion on Earth which has always been unending since birth. Since the ultimate goal of the delivery team is to make a safe delivery and a healthy baby, in recent decades, people have found ways to get help from surgery in cases where the life of the mother or fetus is in danger; however, today it has become a means to deter the pain of labor and this incorrect assumption has been accepted among women that cesarean delivery (C-section), compared with vaginal delivery method, is painless, safer and healthier for delivery.^{1,2} Therefore, today in many societies delivery by cesarean section has become a culture.³ The overall rate of cesarean section serves as one of the indicators of performance of maternal health programs in one country. Unnecessary cesarean rate growth reflects the poor performance of the health system in the country.⁴ The increasing statistics of cesarean delivery (C-section) in many countries is the concern for the researchers and public health authorities. The World Health Organization recommended that the rate of cesarean section should not exceed 15 percent.⁵

In the choice between vaginal delivery and caesarean section, pregnant women step into decision-making. In general, decision-making and selecting the type of delivery are a mental processes that all human beings have been dealing with throughout their lives. Such a process is entangled with culture, perceptions, beliefs, values, attitudes, personality, and knowledge of one's own insight being interchangeably in interaction with other factors.⁶

Lack of knowledge and awareness of the risks of cesarean section and negative perception toward natural delivery affects the choice of cesarean delivery.⁷ Thus, women's request for cesarean section has an important role in increase in the cesarean rate.⁸

Also, women's perceptions play an important role in the selection of the delivery method, which may be the result of

information received from various sources, differing in terms of accuracy and reliability.⁹ On the other hand, it should be stressed that improving maternal health requires multiple and complex factors for choosing the delivery type which will be accomplished in line with the pregnant women's beliefs, values and customs and their understanding of the impact of cultural factors on their childbirth and maternal health, disease, and death.¹⁰

This study aimed to develop and evaluate the psychometric properties of a questionnaire based on Iranian culture to choose the type of delivery in 2015 in Tonekabon, Mazandaran. The scale may help the midwives and obstetricians to be aware of women's decision regarding their choice of delivery type can improve the health, reduce unnecessary cesarean rates and improve maternal health which can serve as an important and effective step towards the goals of the World Health.

MATERIALS AND METHODS

This study aimed to develop and evaluate the psychometric properties of a questionnaire based on Iranian culture to choose the mode of delivery. The study was approved by the ethics committee of Mashhad University of Medical Sciences No. 900985.

This questionnaire has been described by Schneider. The following steps were used to design the project.¹¹

In the first step, perceptions and experiences of 45 pregnant women, postpartum women, midwives, gynecologists and non-pregnant women were determined based on interviews and observations. The researcher, using focused ethnographies, tried to explain the concept of selecting the delivery type and its determinants from the perspective of women in Tonekabon, Northern Iran from January 2012 to November 2013. Subjects were selected based on purposive sampling with diverse strategies and data saturation. The sampling was done with different groups including pregnant women, postpartum women with vaginal delivery method, the

women with Caesarean, midwives and obstetricians and gynecologists, non-pregnant women with different ages, education, number of pregnancies and deliveries referred to the health clinics of Tonekabon. In this qualitative research, prior notice (background information) or repetition of themes with highlights represent the sample size sufficiency and quality. Therefore, in this study, after interviewing and observing 45 participants, the data were obtained. To collect data, we used observation (an hour and a half), semi-structured interviews (an hour) and field notes. The researcher conducted the observations and semi-structured interviews with open-ended questions. Participants included native pregnant women in their third trimester or delivered women referred to health care centers, some midwives and gynecologists. Women with obstetric disorders making it necessary to do cesarean section or those who did not want to participate in study were excluded from the study. Although the time of each interview was dependent on the interview situation and participants' location and time; in some cases, more than one session and two or more interviews were conducted with each person.

Getting the participants' permission, the interviews were heard, accurately recorded and then transcribed verbatim in the shortest possible time; then, they were controlled with the participants (member checking).¹² In this study, data analysis consistent with observations and interviews was conducted using thematic analysis.

In the second stage, based on interviews with 45 participants and clarifying the concept of delivery and the achievement of three themes, a set of the terms in the questionnaires was adjusted.

Then in the third stage, after developing the initial delivery type selection tool, the psychometric properties of the questionnaire were measured using face validity, content validity, construct validity and reliability. Psychometric testing of the decision making on the type of delivery scale (DMTDS) was

performed based on the cultural meanings of decision making towards the type of delivery and its influencing factors based on the focused ethnography using face validity, content validity, construct validity, and internal consistency in 400 samples from pregnant women to postpartum. The first step was to evaluate the face validity because if it was necessary to change the sentences and terms in the questionnaire, the face validity would be under question. To determine its validity, we used both qualitative and quantitative methods and as to face validity quality, the difficulty level, appropriateness and the duality of the questionnaire items were evaluated by 10 experts. Also, 20 subjects from the target group gave their ideas on the understandability and clarity of the items. The items were reviewed by the research team and the necessary improvements were applied. The next stage was to cut down on the number of items and to remove inappropriate items by quantitative approach item effect. In such an approach, if the obtained item effect score for each item from the 20 experts is over 1.5, the item will be fitted and kept for subsequent analysis.¹³

To determine the content validity, we used qualitative and quantitative approaches. Since the qualitative determination of the content validity was based on the judgment of experts, researchers asked 10 experts in the fields of designing tools, reproductive health, and sociology to evaluate and provide feedback on the quality of questionnaires based on the grammar, use of proper words, the necessity and importance of their proper place and proper scoring. To examine the content validity of the quantitative evaluation, we used the content validity ratio and content validity index. The content validity ratio was invented by Lawshe.

In the present study, to investigate the content validity, the initial questionnaire was sent to 10 experts in reproductive health, sociology and tool designing who were faculty members of the University of Medical Sciences and they gave their opinions

on every single question (60 items).

The judgment of these people as a professional group of experts on the criteria of “necessity” was conducted on three scales of “an essential item”, “useful but not a necessary item”, and

“item is not necessary”. The responses were calculated based on content validity ratio (CVR) formula. In this respect, the calculated numbers were compared using Lawshe’s table and items that received the least CVR acceptability at the significance level of 0.05 were considered essential and necessary.

After determining and calculating the CVR, to ensure that the items were ideally designed to measure the content, the content validity index (CVI) was used for the remaining items. CVI calculation was based on the Waltz and Bausell’s content validity index. Thus, 10 experts were asked to calculate the questionnaire CVI and they were asked to comment on the three following criteria for all the items based on the Likert 4-point scale: clarity (1. item is not clear and it is incomprehensible, 2. the item needs a fundamental revision, 3. the item needs minor revision, 4. the item is clear), relevance (1. the item is unrelated, 2. The item is somewhat related but needs to be revised, 3. the item is related but needs minor revision, 4. The item is related), and simplicity (1. The item is not easy, 2. The item needs a fundamental revision, 3. The item needs minor revision, 4. The item is quite simple).

The content validity index for each questionnaire item was calculated. To determine the construct validity of this study, factor analysis was used. In this study, 0.40 served as the minimum factorial load needed to maintain each item load factor in the factors extracted from factor analysis. Statisticians have developed different methods to determine the suitability of data for factorial analysis, the most common of which is the MSA (Measure of Sampling Adequacy) test and Bartlett’s test.

One of the most common measures of reliability is the internal consistency using

Cronbach’s alpha coefficient based on the questionnaire scale. To determine the reliability of research in the study, the internal consistency with Cronbach’s alpha test was used.

To determine the validity and reliability, the data were collected from 400 pregnant women and postpartum women in gynecologists’ office and Tonekabon hospital with convenience sampling. After clarifications of the objectives of the study and the questionnaire, the questionnaires were completed in a self-extracting form. Five-point Likert scale (strongly agree, somewhat agree, no idea, slightly disagree, strongly disagree) was used for responses to the questions in the questionnaire.

To comply with ethical issues, the permission was taken from health centers staff, gynecologists’ clinics and Tonekabon hospital manager to use the records and interviews to observe the qualitative and quantitative study of the questionnaire. Prior to conducting the study, all participants were asked for a written consent. They were also informed that participation in the study was voluntary, and they could stop participation in every stage of the research.

RESULTS

In the first step, in the focused ethnography section, data collection and analysis of the data were done simultaneously using thematic analysis (Getting acquainted with the data, Constructing primary codes, Searching themes, Reviewing themes, Defining and naming themes, Preparing reports). Through data analysis, 420 non-repetitive codes, 22 sub-sub themes, 10 sub-themes and 3 themes (Vaginal delivery as “physical and mental development of a woman”; Cesarean delivery, as “going under the knife to make a delivery without complications and selecting mode of delivery based on interpersonal and intrapersonal factors) were extracted.

Then in the second step, the initial questionnaire on the delivery type was developed with 60 questions in a 5-point

Likert scale on 3 given themes (5: strongly agree, 4: Fairly agree, 3: No idea, 2 somewhat disagree, 1: strongly disagree). Using the questionnaire, the participants were able to rate their agreement with each questionnaire statement from strongly agree to disagree.

Then in the third stage, subjects were aged from 16 to 45 years, with an average of 28.89 ± 5.43 years. The average number of pregnancies was 1.71 ± 1.06 , and the average number of deliveries and abortions were 1 ± 0.97 and 0.23 ± 0.54 , respectively.

Most subjects were housewives with a diploma. 192 subjects were pregnant and 208 had given birth to their babies. Of the 208 pregnant women, 104 subjects had vaginal delivery and 104 delivered by cesarean section.

In this study, 10 experts and 20 members of the target group were used to determine the qualitative validity. After applying the correction, the next step was using the item effect quantitative approach. In this way, the obtained score for 10 items out of 60 items in a sample of twenty members of experts was less than 1.5. Therefore, 50 items in the questionnaire were kept and considered appropriate and important for the next stage of the study.

The qualitative analysis of the content was conducted using the opinions of 10 experts. To quantitatively check the reliability of the content, two indices of content validity and content validity index were used. Since there were 10 people assessing the questionnaires, the minimum acceptability in Lawshe table was 0.62. The results of CVR calculation showed that 4 items had values less than 0.62. Therefore, 46 items were retained for the next step. CVI calculated results showed that 3 items had scores less than 0.8, so 43 items were considered appropriate, so they were preserved.

The average content validity index based on the content validity index was 0.92 for the items of the questionnaire. Finally, the results of the scale validation for the developed tool by researchers being credited in the scientific literature and authoritative content were

confirmed by all the members of experts. After calculating the content validity ratio and content validity index, the total number of items was 43.

The sample size required for factor analysis, based on the literature, was considered to have a proportion of 1 to 5 or to ten, which is why the number of subjects for this study to conduct the exploratory factor analysis was 400. In addition, the condition for sample size sufficiency for analysis had the values of 0.6 based on (KMO) test. Such value for this study was determined to be 0.82. The results of exploratory factor analysis with Varimax rotation showed that Bartlett-Kroitt test was significant ($P < 0.001$, $\chi^2 = 5.56$), showing the suitability and appropriateness of the variables for factor analysis.

In this study, 0.40 served as the minimum factorial load needed to maintain each item load factor in factors extracted from factor analysis. The results of exploratory factor analysis included motivational beliefs on vaginal delivery, social beliefs towards childbirth, motivational beliefs on cesarean delivery, personal beliefs, sources of information, catastrophic thinking, and childbirth experiences (Tables 1, 2). According to the scree plot, from the operating agent of seven, the factors under the study are located in a straight line. Therefore, the 7 factors are acceptable. To determine the reliability of research in the study, the internal consistency with Cronbach's alpha test for a questionnaire consisting of 36 questions was used. The Cronbach's alpha value calculated for the given 7 factors was 0.8. Since the sources considered 0.7 is the acceptable level of reliability for Cronbach's alpha, the resulting reliability was considered good and confirmed. These findings indicate a significant positive correlation with each factor and with the total score of the test.

DISCUSSION

A review of studies on selecting the delivery type in Iran and other countries around the

Table 1: The items of Development and psychometric testing of the decision making on mode of delivery scale (DMMS) in Iranian women

Factors	Items	Factorial loading	mean±SD	Variance (Factor rotation) (70%)	Cronbach's alpha
Factor 1 motivational beliefs on vaginal delivery	I think one of the reasons for choosing vaginal delivery is willing to experience the labor pain.	0.672	4.34±1.05	42.40±7.79	15.45% 0.81
	I think by withstanding the vaginal delivery pain, we can understand the joy of motherhood.	0.682	3.94±1.33		
	People who have a normal vaginal delivery have smaller stomachs compared with those who had cesarean delivery.	0.465	3.81±1.23		
	In my opinion, the second vaginal delivery is easier than the first one	0.533	3.43±1.20		
	Vaginal delivery does not have a negative impact on the fetus health.	0.453	3.88±1.21		
	Vaginal labor pain happens just before and during delivery and after delivery all the pain goes away.	0.650	4.11±1.11		
	I believe that vaginal delivery is a normal phenomenon, because there is no intervention.	0.607	4.13±1.01		
	I believe that by enduring labor pains during vaginal delivery, all sins will be forgiven.	0.437	3.32±1.35		
	I believe that vaginal delivery may pave the way to get close to God.	0.511	3.60±1.33		
	I think after vaginal delivery, the mothers will be able to perform personal tasks and child care	0.457	4.12±1		
Factor 2 social beliefs toward-schildbirth	I think that vaginal delivery compared with cesarean section has fewer complications.	0.418	3.78±1.22		
	People think in some cases, cesarean delivery is done at the companions' request.	0.535	3.23±1.25	13.16±4.23	17.74% 0.79
	Rich people choose cesarean delivery.	0.689	2.49±1.38		
Factor 3 motivational beliefs on cesarean delivery	People believe that women who have cesarean are high special people.	0.678	1.98±1.21		
	People think some people choose cesarean delivery due to their envy.	0.609	3.04±1.43		
	People think Cesarean delivery is analgesia.	0.434	2.48±1.31		
	Every time I hear about the pain of vaginal delivery or think about it, a sense of fear is created in me.	0.474	3.75±1.25	19.39±3.54	16.12% 0.80
	Because I've heard negative stories about vaginal delivery, i do not tend to choose it.	0.558	3.20±1.40		
	Cesarean delivery is short.	0.525	3.47±1.16		
	Seeing the complications of vaginal delivery (such as uterine prolapse which cannot be reformed by surgery) among my relatives, made me choose cesarean delivery.	0.559	3.11±1.22		
Factor 4 motivational beliefs on cesarean delivery	I think if one day I want to have vaginal delivery, vaginal delivery complications in people around made will be repeated for me.	0.621	2.77±1.28		
	I believe in the female genital tract in cesarean delivery remains intact and therefore sexual pleasure during intercourse will not decrease.	0.612	3.18±1.24		

Factors	Items	Factorial loading	mean±SD	Variance (Factor rotation) (70%)	Cronbach's alpha	
Factor 4 personal beliefs	Vaginal delivery is a sign of a woman's peak power	0.463	3.45±1.36	16.53±03.26	19.27%	0.78
	I have the same mode of delivery as my mother did.	0.469	2.75±1.41			
	I think that in cesarean section, the mother does not have a deep maternal feeling to the child.	0.696	3.81±1.32			
	In my opinion, the cesarean delivery means a form of delivery which is out of its natural state.	0.558	2.97±1.35			
Factor 5 sources of information	After a cesarean delivery, the capabilities for child care and personal tasks are reduced.	0.582	3.60±1.16			0.83
	To make my information about the delivery complete, I asked questions from those who had the labor experience.	0.530	4.17±1	16.64±2.84	11.17%	
	The media play an important role in informing pregnant women about the types of deliveries.	0.503	4.06±1.09			
	If a person has a problem for vaginal delivery, cesarean section will be chosen by her doctor.	0.665	4.33±0.97			
Factor 6 catastrophic thinking	Physician help and guide about the advantages and disadvantages of different types of labor and mode of delivery are very impressive.	0.558	4.16±0.96			0.80
	Midwives high examination and their lack of attention make vaginal delivery frightening.	0.485	2.53±1.22	9.84±02.06	9.94%	
	One of the concerns of women is fear of examinations by medical students at hospitals.	0.609	4.21±1.07			
Factor 7 childbirth experiences	One of the concerns of women is fear of dying during vaginal delivery.	0.439	3.11±1.36			0.78
	I think that when a person is satisfied with previous vaginal delivery, she would choose the same type of delivery.	0.606	3.49±1.33	6.88±2.07	10.31%	
	I think that when a person is satisfied with previous cesarean, she would choose the same type of delivery.	0.616	3.40±1.29			

Test: Kaiser Meyer Olkin

Table 2: Factor loading for items of “the decision making on type of delivery Questionnaire”

Items	Factors						
	1	2	3	4	5	6	7
1	0.672						
2	0.682						
3						-0.485	
4	0.465						
5					0.530	0.405	
6					0.503		
7						0.609	
8			0.474				
9	0.533						
10							
11					0.665		
12	0.453						
13	0.650						
14	0.607						
15			-0.558				
16		0.535					
17						0.439	
18		0.689					
19				0.463			
20		0.469		0.400			
21		0.678					
22		0.609					
23							
24	0.437						
25							
26	0.511						
27	0.457						
28							
29				-0.696			
30				0.558			
31			0.525				
32			0.559				
33							
34							0.606
35			0.621				
36			0.612				
37					0.558		
38				0.582			
40		0.434					
41							0.616
42							
43	0.418				0.455		

world revealed the fact that this study is the only study on selecting the delivery type tool based on focused ethnography in the Iranian cultural context. In this study, Cronbach's alpha coefficient for total 7 factors was 0.8, indicating high internal consistency confirming a high reliability of delivery type selection. In

Atghae's study, Cronbach Alpha reliabilities of $\alpha=0.62$ and $\alpha=0.7$ was used for measuring the perception of pain and the desire for a certain delivery type.¹⁴

Willingness to experience the delivery pain, understanding the joy of motherhood, having no impact on the mother's abdomen,

the second vaginal delivery easiness, limited labor pain before and during vaginal delivery, protecting the health of the fetus, the normal birth process, the forgiveness of sins and closeness to God during vaginal delivery, preserving individual abilities and less complications of vaginal delivery compared with caesarean section were the stimulating factors for vaginal delivery serving as a factor in the present questionnaire. Other studies showed that one of the most important factors in the individual's tendency toward vaginal delivery is also affected by several factors including the tendency to experience vaginal delivery, previous appropriate vaginal delivery, concerns about the safety of mother and child, faster recovery after the delivery, fear of anesthesia and advantages of this delivery type.^{15,16} A study in Iran designed a questionnaire including questions on the reasons for selection of cesarean section (fear of delivery, mother's health, fetus's health, family recommendations, tubal ligation) and attitude measurement toward vaginal. The questionnaire's validity by content validity and its reliability by Cronbach's reliability (0.825) has been confirmed. Results showed analgesia operating procedures, lack of harm to the fetus, no need for frequent examinations, and prevention of deformed genitalia were the main reasons for choosing cesarean delivery.⁷

Some of the items in the present questionnaire has been developed reflecting the cultural and social factors influencing the delivery type selection. However, in other countries, social and cultural factors play an important role in increasing cesarean delivery.¹⁷

Consistent with our study, the findings of a study conducted in Iran showed being afraid of labor pain, hearing negative stories about vaginal delivery, experiencing a convenient and short-term cesarean delivery, observing the complications of vaginal delivery in others, believing in the complications repeating in the individual and the other family members and the absence of sexual disorders by cesarean delivery were considered as the main stimulating beliefs leading to the

cesarean delivery which were included in the questionnaire. Factors such as previous cesarean records, fear of vaginal delivery, concerns about the risk of sexual disorders in other studies caused by vaginal delivery and the comfort of cesarean delivery led to the women's desire to choose caesarean section.¹⁸

One of the personal beliefs in the present study was the decreased individual abilities in the personal tasks and child care after cesarean. A study in Iran also showed that subjects believed that cesarean delivery would result in pain relief, but the pain and discomfort after the surgery would reduce the mothers' ability in doing their maternal responsibilities and child care.¹⁴

The results of the present study showed that people's awareness of delivery types through the doctor and media would be effective on their delivery type selection. A study in Sweden demonstrated that false information served as one of the factors in increasing the mothers' fears and concern in delivery type selection, as well.¹⁹

In this study, one of the factors in delivery type selection was the terrible ideas. The high number of midwives' examination and their lack of attention, medical students' examination at hospitals and fear of dying during delivery were among the terrible ideas underlying vaginal delivery which make pregnant women more willing to have caesarean section. Gamble's study has also pointed to choosing cesarean delivery as a result of vaginal delivery fear and lack of awareness of the risks associated with cesarean section.²⁰ Another study recapped the pregnant women's fear of vaginal delivery as the lack of confidence in midwifery personnel, fear of his helplessness, fear of maternal and neonatal mortality and the unbearable vaginal delivery pain.²¹ A study in Iran determined women's attitude toward labor pain by a questionnaire consisting of seven items (Delivery is boring, Labor is intolerable, Labor is fatal, Labor is scary, Delivery is disastrous, Delivery is terrifying, Delivery is suffering). Content validity of the questionnaire of that study

based on comments of 15 members of the faculty of Kerman University of Medical Sciences was determined and its reliability by Cronbach's reliability (0.62) was confirmed. This study showed that women believed vaginal delivery was more frightening and frustrating than cesarean delivery.²²

The results of the present study revealed that one of determinants of delivery type selection is the satisfaction of the prior experience. Other studies have also shown that giving birth to a child (delivery) is a multi-dimensional process enjoying physical, emotional, social, physical, cultural and psychological aspects and serves as a critical experience in women's life.²³

Women's delivery expectations affect their satisfaction experiences. An extensive futuristic study by Green in Southeast England showed that negative expectations were associated with poor mental health outcomes and women who expected more pain during labor, were more likely to experience it.²⁴ Researchers linked the problems related to mother and baby to unforeseen negative delivery experiences.²⁵ The limitation of the study was the absence of similar tools to be compared with the present study.

CONCLUSION

The scale developed appears to be a valid and reliable tool for health care providers to measure women's decision making towards the type of delivery. Thus, this tool can be used in the Iranian Cultural Society. The scale may help the midwives and obstetricians to be aware of the women's decision regarding their choice of the type of delivery and as a result to plan appropriately in order to reduce unnecessary cesarean sections.

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