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Individual Counseling Based on Fogg Behavior Model and Its Effect on Decision Self-Efficacy and Decision Conflict in Choice of Vaginal Birth After Cesarean Section: A Randomized Clinical Trial

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Abstract

Background: Given the high rate of cesarean section complications, mothers who have had previous cesarean sections should change their behavior toward delivery. Self-efficacy plays important role in mother's ability to adapt to vaginal birth and reduce tendency to cesarean section.

Aim: The current research was conducted with aim to investigate the individual counseling based on Fogg behavior model and its effect on decision self-efficacy and decision conflict to choose vaginal birth after cesarean section.

Method: This randomized clinical trial study was performed on 62 pregnant women referred to the comprehensive health centers of Mashhad in 2020. The intervention group received two face-to-face individual counseling sessions based on Fogg's model every 2 weeks for 45-60 minutes and one virtual session on the Telegram channel. Data analysis was done using SPSS software (version 25) and the statistical tests of Mann-Whitney, Chi-square, Fisher exact, independent t and paired t-test. $p<0.05$ was considered significant.

Results: Mean score of Fogg's model showed a significant difference between the two groups (2.79±0.52 vs. 2.33±0.31). Mean score of decision self-efficacy and decision conflict had a statistically significant difference after the intervention (3.44±0.45 and 1.03±0.33, respectively) compared to before the intervention (2.57±0.97 and 1.44±0.59, respectively) in two groups. The mean score of Fogg's questionnaire was significantly different between the two groups ($p<0.05$).

Implications for Practice: Counseling based on Fogg model promotes decision self-efficacy and reduces decision conflict in choosing vaginal birth after cesarean section. Maternal health care providers should consider this approach in consultation with previous cesarean section mothers.

Keywords: Cesarean section, Choice behavior, Decision conflict, Decision self-efficacy, Individual counseling

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Introduction

Childbirth is a physiologic event that is performed without intervention. Insufficient knowledge about the complications of cesarean section (CS) and also the negative attitude toward vaginal birth are the reasons for increasing the desire of pregnant women for CS (1). About 3.1 million women in the United States experience CS each year (2). Almost, 48% of all births in 2018 in Iran were performed by cesarean section (3). Although vaginal birth after cesarean section (VBAC) is an important strategy to reduce the rate of CS (4), but it's rate in Iran is very low (0.8%) (5). The benefits of VBAC compared to repeat cesarean include shorter duration of hospital stays and reduced risk of bleeding, infection, blood clots, and placental abruption. Moreover, VBAC is associated with decreased rate of respiratory distress, neonatal pulmonary hypertension, and hospitalization in the intensive care unit (ICU).

The definite risk of neonatal mortality in VBAC cases is very low and comparable to the potential risk in the first pregnancy (6, 7). It is necessary to provide appropriate knowledge about the benefits and complications of VBAC and apply the significant role of healthcare providers in helping mothers decide mode of delivery (8, 9). Since women have no awareness regarding the possibility of VBAC, they decide to repeat cesarean section (10), uncertainty about the results of delivery, fear of unpleasant experiences, no access to a physician, others' opinion about mode of delivery (11, 12), insufficient encouragement (5), lack of self-confidence, negative attitude of mother, and insufficient self-efficacy in decision-making (13, 14). The decision-making refers to choosing one of several options and weighing the pros and cons of a particular issue, which is called ambiguity and incompatibility. One of the most important factors in decision-making conflict is the existence of advantages and risks that cause doubts in decision-making (15). Therefore, pregnant women should be encouraged to consider all the choices about a particular topic based on their benefits and risks, and to evaluate their own performance, experiences, and personal values, and this requires self-efficacy (13).

Self-efficacy is the most important prerequisite for predicting behavior in stressful situations and women who choose VBAC experience emotional changes during their pregnancy decision-making process and decision self-efficacy promotion is an important strategy for active participation in behavior change (16, 17). Decision self-efficacy refers to a person's self-confidence to make decisions which lead to the desired outcomes. Hosseini et al. in their study stated that shared decision-making enhances the knowledge of mothers with previous CS regarding choosing mode of delivery and decreases decision conflict (18). Some studies found that counseling process reduces anxiety and conflict in decision-making processn(19, 20). Shared decision-making can reduce the anxiety score and increase the score of decision satisfaction in mothers with previous CS (21).

FBM (Fogg Behavioral Model) was introduced by Dr. Fogg (2007) as a practical model to maximize motivation and appropriate choice (22). In this model, a behavior occurs in the presence of three factors, including motivation, ability and stimulus simultaneously. Ability indicates the ease or difficulty of intervening in a behavior, motivation means how a person tends to intervene in a behavior, and stimulus means the potential factors in the behavior. This model shows that after the occurring stimulus, people with high motivation and ability behave. In Fogg's model, motivation deals with three concepts, including fear/hope, pain/pleasure, and rejection/social acceptance, and ability deals with resources including money and time, mental and physical conflict, social deviation and anomaly. In their research, Attarian et al found that the Fogg behavior model is effective in choosing VBAC (23), increasing self-efficacy in childbirth (24) and reducing fear of childbirth (25). The Fogg model increases motivation and ability and focuses on pleasure, hope, support, empowerment, self-efficacy and encouragement in the decision-making (22). Since the low rate of VBAC in Iran, and no obvious benefits of cesarean section for baby and its side effects and economic costs, it is necessary to focus on decision-making regarding mode of delivery. Counseling with mothers during pregnancy can reduce unnecessary cesarean section by making correct decision (20). Therefore, the purpose of conducting the current research was to assess the effect of counseling based on Fogg model on decision self-efficacy and decision conflict in choosing vaginal birth after cesarean section.

Methods

This randomized controlled clinical trial study was performed on 62 pregnant women with once prior cesarean section from health centers of Mashhad between May and December 2020 who volunteered to participate in the research and met inclusion criteria based on the purpose of the study. The subjects

were randomly allocated in the two groups (counselling group based on Fogg's model and control group). Inclusion criteria consisted of willingness to participate in the study, age 18-40 years, cesarean section in the last pregnancy, gestational age 28-30 weeks based on the first day of the last menstrual period or ultrasound of the first trimester, singleton pregnancy and live fetus with cephalic presentation, normal implementation of the placenta and normal amniotic fluid volume based on ultrasound of the second half of pregnancy, low transverse cesarean incision and interval of more than 6 months between previous cesarean to the first day of the last menstrual period of the current pregnancy, and no medical or obstetrics complications and no indications for cesarean section. Exclusion criteria included: absence in at least one counseling session, no participation in the post-test, indication of pregnancy termination before the end of research period, incomplete questionnaires, failure to receive channel and pamphlet content, medical illness and obstetric complication during the study process.

The multi-stage method was applied for sampling in the comprehensive health centers of Mashhad. First, among the comprehensive health centers of Mashhad city (health centers 3, 2, 1, Samen and 5), comprehensive health center number 1 and 3 were randomly selected. From each of these centers, 4 subunit centers were selected according to the number of covered population and the location dimension (based on diversity of economic and cultural status). In order to prevent interaction and dissemination of information between two groups, two subunit centers were assigned to each group by random allocation from each center. For random allocation, the names of the subunit centers and the names of the groups were written on separate papers and placed in two separate envelopes. Then, simultaneously, the names of two centers and one group were selected from two envelopes. In this way, four subunits were assigned to each group. Then, inside each center, available sampling was done. To the best of our knowledge, at the time of designing this study, there was no similar study that could estimate the treatment effect of the intervention on the two variables of decision conflict and decision self-efficacy that could be used to determine the sample size. Therefore, the sample size was determined based on the effect size formula and considering 5% error and 80% power test and high effect size (0.8). The sample size was calculated as32 people in each group.

Research tools were demographic and obstetrics profile questionnaire, Fogg model checklist, decision self-efficacy scale and decision conflict scale. Fogg model checklist was developed by the researcher which consisted of three sections. The first section consists of 23 phrases related to the first factor (motivation), the second section include 29 phrases related to the second factor (ability) and the third section includes two phrases related to the third factor (stimulus). The first and second sections are scored on a 5-point Likert scale (strongly agree, agree, no opinion, disagree and strongly disagree) and the third section is scored on a 5-point Likert scale (very high, high, medium, low and very low). The score 1 indicates the lowest level of motivation and ability and no effect of stimulus, and the score 5 indicates the highest level of motivation and ability and effect of stimulus, and in total phrases, a higher score indicates more motivation and ability. In addition to content validity, CVR and CVI were also determined for Fogg model checklist and among a total of 60 designed expressions, 6 expressions with $r < 0.80$ were removed.

The standard decision self-efficacy scale was designed by Bunn in 1996 and includes 11 phrases that measure an individual's self-efficacy in decision making (26). The validity of the Persian version of the scale was determined by Pakdaman (27). The answers to the phrases are scored on a 6-point scale from 0 to 6, so that a score of 6 is given to the completely safe option and a score of 0 to the completely uncertain option. The final score is obtained through the sum of the scores of the related phrases and the total score is ranged from zero to 66. A higher score indicates higher levels of decision-making self-efficacy. The Decision Conflict Scale (DCS) was designed in 1995 by O'Connor. Decision Conflict Questionnaire is used to measure the degree of doubt and delay in pregnant women to decide about choosing the mode of delivery, which was first validated in Iran by Andaroon et al. (28) and consists of 16 phrases which is scored on a five-point Likert scale from 0 to 4 (strongly agree- agree- no opinion- disagree- strongly disagree). Zero means "strongly agree" and 4 means "strongly disagree". Total mean higher than 2.5 in this scale indicates the highest level of conflict or uncertainty in the decision, and total mean 2 or less than 2 shows that there is no conflict in decision making and implementation. These questionnaires were completed by the participants at the beginning of the study and two weeks after the intervention.

The validity of all tools was determined by content validity method. In this way, these forms were

prepared based on new texts and articles under the supervision of supervisors and consultants, and then were confirmed by seven faculty members of reproductive health and psychologist in Mashhad University of Medical Sciences. The final tools were used after considering their comments and opinions. The reliability of the questionnaire was confirmed based on Fogg model (internal consistency) with Cronbach's alpha coefficient of 0.72. The reliability of the decision self-efficacy questionnaire was determined in the study of Bunn et al with an alpha coefficient of 0.84 (26). The reliability of the Persian version of this questionnaire was determined in the study of Pakdaman with an in-cluster correlation coefficient of 0.84 (27). The reliability of the questionnaire in this study was confirmed with a Cronbach's alpha coefficient of 0.82. Moreover, the reliability of the decision conflict questionnaire was confirmed in the study of Toohill with Cronbach's alpha coefficient of 0.78 (29) and the reliability of its Persian version was confirmed in the study of Andaroon with Cronbach's alpha coefficient of 0.93 (28). The reliability of the questionnaire in this study was confirmed with Cronbach's alpha coefficient of 0.81.

After approval, the individuals who met the inclusion criteria and had informed consent entered the study and were randomly assigned to the intervention and control groups. The subjects in both groups completed the research questionnaires. Both groups received routine care, including pregnancy care by the health care provider, attending in childbirth preparation classes and training on choosing the mode of delivery in the sixth session, referring to a gynecologist for scheduling the repeated cesarean. In the intervention group, in addition to routine care at the health center, individual face-to-face counseling based on the Fogg's model was provided by the researcher in two sessions (45-60 minutes) every two weeks and as much as possible in accordance with the attendance of mother in the health center for routine cares. Intervention started at the gestational age of 28-30 weeks. Also, an in-person counseling session was held via the Telegram channel due to coronavirus epidemic during the research time, the content of third session was presented through virtual in the Telegram or what's up channels). In the first session, the counselor presented interactions on creating a positive motivation for vaginal childbirth and reducing decision-making conflict, including stating the benefits of vaginal childbirth for mother and baby, the complications of repeated cesarean section for mother, and its effect on fertility. The second session was planned to the content of ability factor of the model by focus on empowering the mother to accept her preferred mode of delivery, promotion decision self-efficacy, strategies to relief labor pain, helping mother to realize potential abilities in informed choice, and addressing the concerns of clients. By choosing, she says, cultivating positive points in her choice, removing obstacles and conflicts in decision-making from her point of view, and identifying the factors influencing the decision-making and helping her to make them real. In the third session, which was held in the Telegram channel due to the epidemic coronavirus disease, all educational and motivational contents related to the choice of delivery mode (videos related to cesarean section and vaginal birth, non-pharmacological methods of labor pain management, exercises during pregnancy and childbirth, auditory file of interviews with mothers who experienced successful vaginal birth after cesarean, VBAC pamphlets) were provided to research participants. In this study, participation in an individual counseling program was considered as an equal stimulus in the intervention group and its effect was evaluated in comparison with the control group. Moreover, increase in the score of Fogg's model checklist was noted as primary outcomes and improvement in decision self-efficacy and decision conflict was considered as secondary outcome measures. Therefore, two weeks after the intervention, the questionnaires were again completed in two groups and the educational pamphlet was given to the control group. Figure 1 shows flowchart of the study.

Data were analyzed by SPSS (version 25) using Chi-square, Mann-Whitney, Fisher's exact, independent t test, Paired t-test. $P< 0.05$ was considered statistically significant.

Ethical Consideration

The study protocol was approved by the Ethics Committee of Mashhad University of Medical Sciences with the code number of IR.MUMS.NURSE.REC.1398.081 (date: 30/12/2019). The objectives of the research were described to mothers, and they were free to raise any questions. Mothers' hazards and rights were also elucidated.

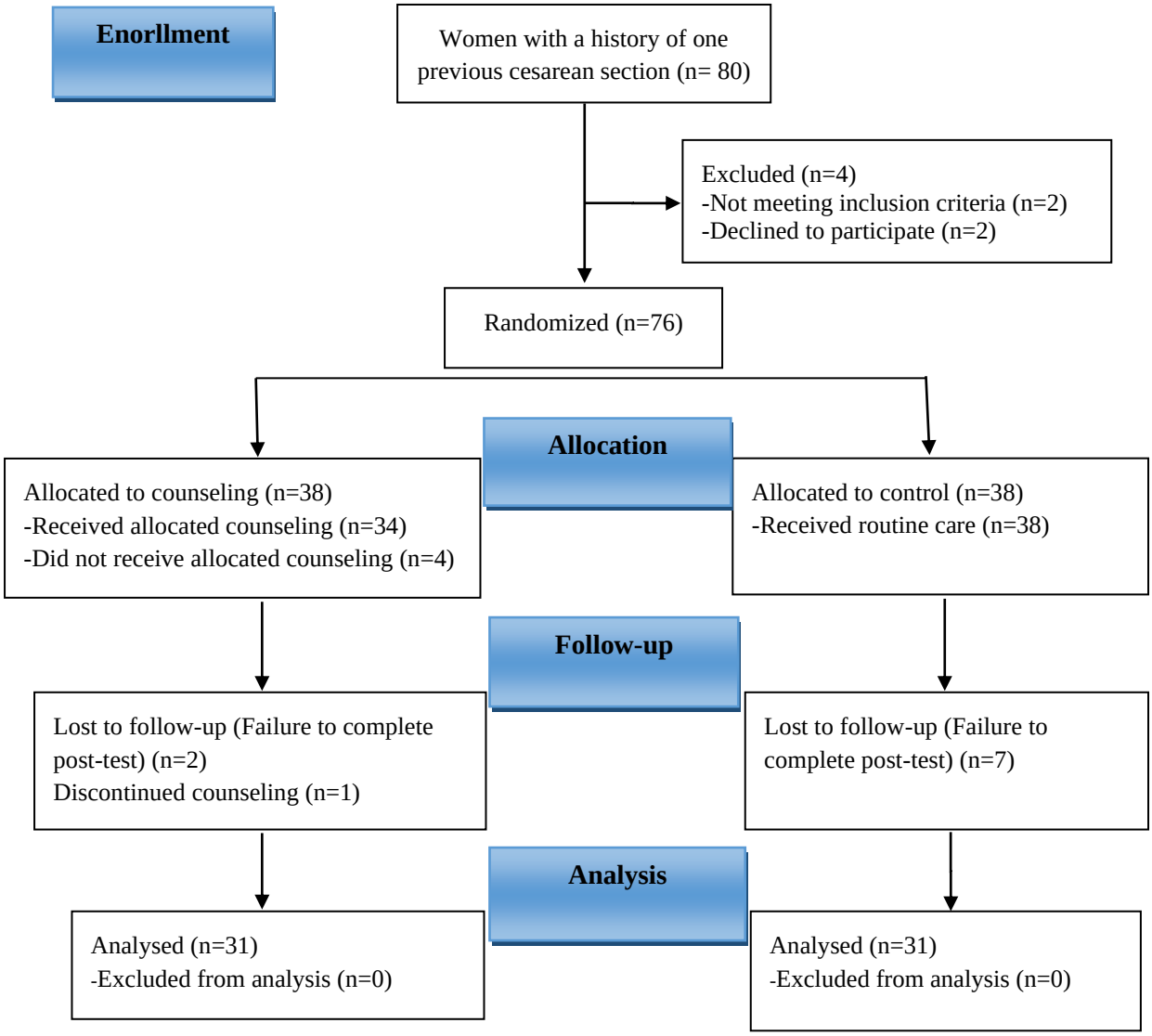

Figure 1. Flowchart of the effect of individual counseling based on Fogg behavior model to choose vaginal birth after cesarean section

Results

Out of 80 mothers with previous caesarean section, 76 subjects who met the inclusion criteria were randomly allocated to the intervention and control groups. Accordingly, 31 mothers in each group completed the study.

The results of Mann-Whitney, Fisher's exact and Chi-square tests showed that the two groups were homogeneous in terms of individual and midwifery characteristics (Table 1). The mean score of Fogg's model checklist before and after the intervention was reported in Figure 2.

At the beginning of the program, the average decision self-efficacy score in the counseling and control groups was 2.57±0.97 and 3.18±0.82, respectively (p=0.010). After the intervention, the average score in the counseling and control groups was 3.44±0.45 and 3.12±0.81, respectively (p=0.061). In general, the mean score of decision-making self-efficacy after the intervention had a statistically significant difference between the two groups, and it increased more in the counseling group than before the intervention (p<0.001) (Table 2). The mean decision conflict score in the counseling group after the intervention decreased significantly (-0.41±0.55), while it increased by 0.07 in the control group (Table 3).

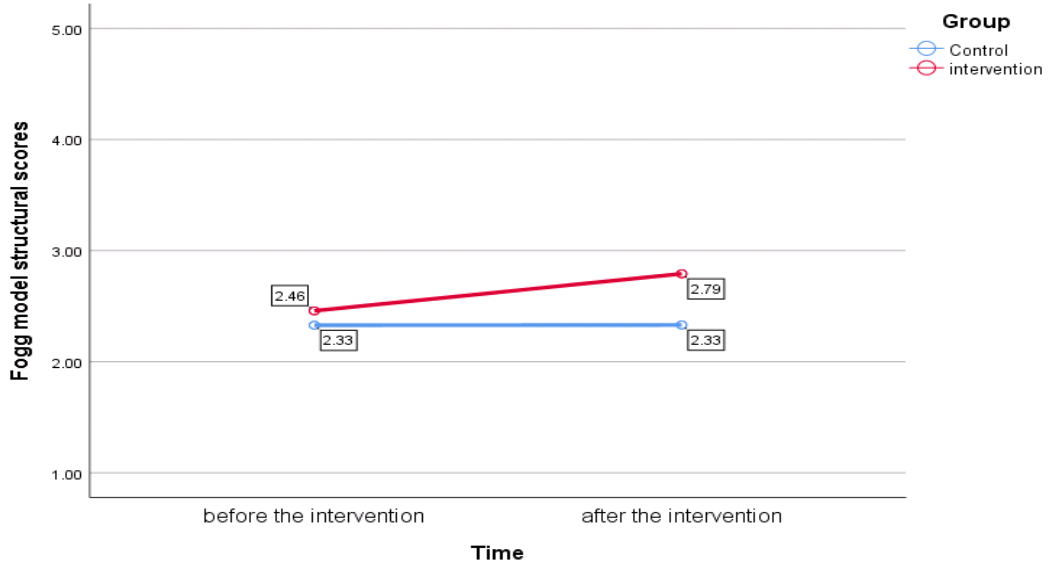

Figure 2. Mean of Fogg's model scores before and two weeks after the end of the intervention

Table 1. Characteristics of participants in the intervention and control groups

Quantitative variables	Mean ±SD		*p*-value
	Control (n=31)	Consulting (n=31)	
Age (year)	29.39±1.14	29.56±4.14	0.301*
Pregnancy age (weeks)	29.39±1.14	28.74±1.18	0.351*
Number of Pregnancy	2.27±0.57	2.47±0.82	0.301*
Number of Children	1.00±0.24	1.12±0.32	0.417*
The interval between last and current pregnancy	4.97±1.94	5.06±1.89	0.975*
Qualitative variables	N (%)	N (%)	*p*-value
Education			
Primary education	1(3.2)	1(3.2)	0.157**
Secondary education	3(9.7)	6(19.2)	
High school	12(38.7)	17(54.8)	
Post graduate	15(48.4)	7(22.6)	
Job			
Housewife	26(83.9)	28(90.3)	0.707**
Employed	5(16.1)	3(9.7)	
Family income			
Less than enough	2(6.5)	3(9.7)	>0.999**
Just enough	28(90.3)	28(90.3)	
More than enough	1(3.2)	0(0.0)	
Insurance coverage			
Yes	31(100)	28(90.3)	0.238**
No	0(00)	3(9.7)	
History of vaginal birth			
Yes	3(9.7)	5(16.1)	0.707**
No	28(90.3)	26(83.9)	
Satisfaction with previous cesarean section			
Yes	24(77.4)	26(83.9)	0.749***
No	7(22.6)	5(16.1)	
Spouse's advice for mode of delivery			
Cesarean section	17(54.8)	14(45.2)	0.412**
vaginal birth	1(3.2)	4(12.9)	
No comment	13(41.9)	13(41.9)	
Pregnancy type			
Planned pregnancy	22(71.0)	20(64.5)	0.165**
Unplanned pregnancy	9(29.0)	11(35.5)	

*Mann-Whitney test, **Fisher's exact test, ***Chi-square test

Table 2. Mean scores of decision-making self-efficacy in women with previous caesarean section

Variable	Counseling group (n=31)	Control group (n=31)	*p*-value *
Before intervention	2.57±0.97	3.18±0.82	0.010
Two weeks after intervention	3.44±0.45	3.12±0.81	0.061
Mean changes before consultation and two weeks after consultation	0.86±0.93	-0.06±0.61	<0.001
p-value **	<0.001	0.579	

*Independent t test; **Paired t-test

Table 3. Mean scores of decision conflict in women with previous caesarean section

Variable	Counseling group (n=31)	Control group (n=31)	*p*-value *
Before intervention	1.44±0.59	0.91±0.46	0.193
Two weeks after intervention	1.03±0.33	0.98±0.36	<0.001
Mean changes before counseling and two weeks after counseling	-0.41±0.55	0.07±0.38	0.008
p-value **	<0.001	0.028	

*Independent t test; **Paired t-test

Discussion

This research aimed to determine the effect of the individual counseling based on Fogg behavior model on decision self-efficacy and decision conflict to choose vaginal birth after cesarean section in mothers with previous CS referred to the comprehensive health centers, Mashhad, Iran. According to the results of this study, the mean score of the decision self-efficacy did not differ between the two groups before the start of the intervention. This lack of difference increases the accuracy of the results and better examines the changes related to the effect of Fogg-based counseling on the decision self-efficacy score. After the intervention, the mean score of the decision self-efficacy were statistically different between the counseling and control groups. So, the score of decision self-efficacy was significantly increased in the counseling group compared with the control group. In other words, mothers who participated in Fogg-based counseling sessions had higher self-efficacy about the choice of mode of delivery. Moreover, the mean score of decision conflict regarding the choice of childbirth decreased in the intervention group. In other words, mothers who participated in Fogg-based counseling sessions were less conflicted about the choice of delivery method. On the other hand, they were more aware of the benefits and risks of delivery mode, social support, and appropriate decision making. In addition, individual motivations and abilities were taken into account to a greater extent in decision making. This finding is very important because decision-making conflict causes people to change their mind, delay their decision and make decisions with undesirable consequences (30). Deciding about mode of delivery after cesarean section is very difficult for pregnant women due to several factors which should be considered (31).

To the best of our knowledge, no study assessed both self-efficacy and decision conflict in choosing vaginal birth after cesarean. Scaffidi et al. assessed the relationship between knowledge and self-efficacy of deciding for vaginal childbirth after cesarean section. Their results showed that women who have more knowledge may choose vaginal childbirth after cesarean section, but the results did not show that women's involvement is a statistically important factor in the decision-making process (32). This difference in the result can be Because of counseling based on Fogg's model in our study. The results of a review of systematic reviews by Park et al. showed that decision aids positively affect healthcare provider outcomes by increasing satisfaction, reducing decision conflicts, and lengthening clinical consultations (33). Montgomery et al. conducted a study on 742 pregnant women to help them decide to give birth after cesarean section. Their results showed that decision support can help women who had a cesarean section in past pregnancy decide on the mode of delivery in the next pregnancy (34). The results of these studies were consistent with the present study, which was conducted with a much smaller sample size.

The decision-making process is the choice of one from several options and weighing the pros and cons on a particular issue, which is called the ambiguity and incompatibility that arises in this process (15). Wise et al. showed that women who were initially unsure about their preferred mode of birth

showed a further decrease in the score of decision conflict after receiving additional decision support and were more likely to plan for VBAC (35). The results of a study conducted by Moudi et al. showed that the total score of decision conflict as well as the scores of subscales (awareness, clarity of values, social support, uncertainty and effective decision making) were significantly lower in the intervention group compared to the control group (30). The findings of the present study were consistent with the findings obtained in the above studies. Therefore, counseling is effective in moderating decision conflict, improving the decision making and adapting with this choice from the options ahead. Hadizadeh et al. showed that decision-making counseling sessions for pregnant women with previous cesarean sections increase awareness, value clarity, and decision support; So it can be an appropriate strategy in reducing decision conflict and regret as well as increasing the VBAC rate (20), which was consistent with the present study. Providing accurate information and supporting the expression of emotions, as well as eliminating misconceptions about the choice of childbirth by health care providers, as well as increasing awareness of the risks and complications of repeated cesarean section, enable people to make decisions based on their knowledge and ability and can reduce decision conflict. Tohil et al. reviewed 339 pregnant women in Australia and concluded that telephone counseling was not significantly effective on the conflict of decision-making of pregnant women in choosing the mode of birth in two groups (29), which did not agree with the results of the present study. Possible causes are cultural differences and beliefs of research participants, as well as the method of implementation and different content of counseling sessions in two studies. In a study by Kuppermann et al. patient-centered decision support tools had no effect on decision-making conflict (36). Their results contradict the findings reported in the present study. This difference can be attributed to gestational age at the time of the intervention. In the above mentioned study, the intervention was performed before the 25th week of pregnancy and most participants were highly educated and used tablet-based decision support tools, while in the present study, it was performed after the 25th week of pregnancy and face-to-face counseling was performed.

Since increasing decision-making self-efficacy and reducing conflict in women who have had a previous cesarean section is more difficult than mothers without cesarean section experience, and due to the emphasis of the Ministry of Health of Iran on reducing the rate of cesarean section, more research is necessary in this target group. One of the strengths of the study is considering this necessary and previous cesarean section mothers as a specific group that need to counseling process in choice of birth mode. Individual motivation and personal ability in counseling can be examined through individual clinical counseling and to focus on this factor can be effective in helping to choose the mode of birth. This study had some limitations: concurrency of the study with the coronavirus epidemic, which limited providing counseling sessions, also no blinding of the study due to the nature of study, and the intervention and data collection was done by the researcher and it was possible to receive information from other sources.

Implications for practice

Increasing decision self-efficacy and consequently reducing decision conflict in the counseling of vaginal birth after cesarean section along with other strategies. Implementation of this approach is simple and needs low-cost and also is in concordance with the aims of Ministry of Health of Iran to reduce cesarean section rate, hence, it is suggested that maternal care providers to employ this model for empowerment of previous cesarean section mothers to choose mode of birth.

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Conflicts of interest

The authors declared that they have no competing interests.

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The Research Deputy had no role in the design, collection, analysis, and data interpretation the study.

Authors' Contributions

Conceptualization and Formal Analysis: Somayeh Attarian, Mahboobeh Firoozi, Zhaleh Feyzi. Data curation, Investigation and Writing the original draft: Somayeh Attarian. Software and data analysis: Jamshid Jamali. Methodology, Validation and review & edite: Somayeh Attarian, Mahboobeh Firoozi, Zhaleh Feyzi, Jamshid Jamali. All authors read and approved the manuscript.

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