The application of the theory of planned behavior in the choice of delivery method for first-time pregnant women in Sirjan

Abstract

Aims: Cesarean method is one of the most common surgical procedures among women in the recent years. Lack of information and negative attitudes towards natural childbirth are the most main the reasons behind the increase in pregnant women's tendency toward the cesarean section. This study investigated the effect of educational intervention based on the theory of planned behavior (TPB) on natural childbirth tendency among the primiparous women of Sirjan in 2022.

Materials and Methods: This controlled interventional research with a population consisted of 140 primiparous women (n=70 women in each group) who attended the health centers in Sirjan in their 18th to 30th month of pregnancy. Multi- stage sampling method was applied to select participants. The intervention was carried out based on the TPB during four 45-60 min sessions. A questionnaire was used for data collection before and after the intervention. The SPSS22 software, Paired t-test, Independent t-test, Fisher's exact test, and Chi-square test were used to analyze the data.

Results: The intervention program had a positive effect on the mothers' perceived behavioral control (P=0.046). The intervention could increase the number of people who did the natural delivery in the intervention group. There was no improvement in the individuals' attitude (P= 0.75), subjective norms (P=0.11) and behavior (P=0.23).

Conclusion: In conclusion, the TPB can be effective in reducing elective caesarean section among women under the study. It is recommended that intervention programs are to be designed and carried out based on behavioral change theories.

Keywords: Childbirth, Pregnant women, The theory of planned behavior, Primiparous women

Introduction

Delivery is a grace of God to produce humans on earth and has always been so. Delivery is a spontaneous process and does not need intervention and it has been done naturally for years [1, 2]. Natural childbirth is a natural and physiological process with a lot of advantages [3] such as being cost- effective, shorter hospital stay. It does not require anesthesia and has lower risks of infection and hemorrhage. The cesarean section (C-section) has more serious and severe complications compared to natural childbirth [4, 5]. C-section is a normal procedure when natural childbirth is considered a risk for the mother and or the child and it plays an important role in reducing the risk of labor complications and mortalities in the last century [6].

The C-section removes the fetus by cutting the abdominal and uterine wall [7]. Nowadays, this method that was only invented to use for emergency condition and saving the mother sand child's life, it has become a tool to escape the pain of childbirth, so that it has become a culture in many societies [8]. It should be noted that C-section has more costs and complications compared to natural childbirth [9, 10]. The C-section mortality is seven times more than natural childbirth and several health problems such as uterine infection, cardiac problems and pulmonary thromboembolism, postpartum hemorrhage, pelvic injuries, surgery and obstetrical difficulties may occur as its complications [10, 11]. In addition to higher postpartum mortality rates for mothers and causing physical and psychological complications for the mothers, C- section costs 2-3 times more for the mother and the family. Also, the mother's difficulties with performance after C- section may lead to lack of attention, providing complete care and proper breastfeeding after childbirth [12]. One of the reasons behind the increase in number of C-section is non- medical and by mothers' request. C- section rate is less than 10% in 40% of the countries, it is between 10- 15% in 10% of the countries, and more that 15% in 50% of the countries [13]. According to the statistics compiled by the ministry of welfare and social security, C- section has increased from 44.6% to 45.3% between 2010 and 2012 [1]. C- section prevalence is three times more than the international statistics in Iran [14]. The World Health Organization considers the acceptable rate of C-section to be 10-15% of the total number of childbirths and it is no justification for its increase in different parts of the world [15]. In addition, 85-90% of the deliveries can be done naturally and without any intervention [16]. In most cases, the scientific indications do not determine the method of delivery, instead ignorance, beliefs, behaviors and wrong attitudes are determining factors [17, 18].

The patterns of behavior can be important for evaluating people's attitude towards health-related behaviors. The Theory of Planned Behavior (TPB) is one of the best models used for reproductive attitudes and behaviors [19-21]. Several studies have used the theory in their interventional studies [22, 23]. The Model's components include a) Behavior; the single action by the individual, b) behavioral intention; the individual's mental inclination to perform the behavior, c) attitude; the overall feeling of hate or desire towards a certain behavior, d) perceived behavioral control; how much the individual believes that he can behave according to the specific established behavior, e) subjective norms; the influential people in the individual's life who expect people to act in certain ways [24]. This model indicates that the individual's intention is determined by two assumptions. One is comparison of personal factors and social influences [25]. Social factors are very effective in choosing the delivery method, since the TPB is one of the few theories that pay specific attention to social factors in creating people's behavior [26, 27]. Thus, the research team aimed to evaluate the impact of intervention on the tendency to natural childbirth within the framework of this model, among the primiparous women in Sirjan.

Similar to this study, the researchers and community health workers provided the training. However, in this study, the training and intervention sessions were provided by gynecologist and researches for participants who have suffered from C- section complications. As these people form subjective norms for the individuals and may affect the individuals' attitude, evaluation of the results and eventually the individual's intentional behavior, we applied the TPB model to assess the effect of the intervention.

Material and methods

Research design and sampling

The present study is a controlled interventional research. The study population consisted of 140 primiparous women (n=70 women in each group), who attended the health centers in Sirjan from 18th to 30th weeks of pregnancy. The study population was determined as 62 individuals in each group based on a previous study [16], (the sample sizes were increased in number by 15% and

were eventually 70 individuals in each group to compensate for the excluded individuals). It should be noted that the 80% power of this study can detect the mean score difference of the structures for a score of 6 and higher. The sampling was Multi-stage random; and out of 12 existing healthcare centers in Sirjan, 6 centers were cluster sampled and out of each cluster, one center was randomly selected. Eventually 6 centers were selected using simple random allocation, 3 centers were randomly determined as intervention and 3 centers as non-intervention group. From each center 24 individuals were randomly selected to participate in the study.

Inclusion criteria

Inclusion criteria consisted of resident in Sirjan, being literate, primigravida, gestational age between 18- 30 weeks, lack of history of recurrent abortion, placenta previa, premature delivery, twins and multiple pregnancies and chronic diseases (diabetes, cardiovascular diseases and ...), aged between 18 to 35 years old, and willingness to cooperate. The exclusion criteria of the study included absence in sessions and classes more than one session. An appreciation gift was then given to the participants as incentive.

Measurement tool

The data collection tool was a questionnaire containing two parts. The first part consisted of 6 obstetric and demographic questions (age, education, occupation, history of abortion, months of pregnancy, and probable date of birth), and the second part was designed based on theory of planned behavior's structures, including 7 attitude questions, 7 perceived behavioral control questions, and 7 questions of subjective norms questions. All the questions were according to 5-point Likert scale; from strongly agree to strongly disagree); and one question of subjective norms questions was multiple choice (four-option multiple choice questions). Finally, behavioral intention was assessed by one question.

Validity and reliability

The validity and reliability of the questionnaire was evaluated in a previous similar study in 2014 (6). The reliability of the questionnaire was revaluated by test-retest method after ten days on 15 primiparous women who were in their 5-7 months of pregnancy. It was conducted on women other than those participating in the main study. The questionnaire appears to have good test-retest reliability ($r=0.91$, $P<0.0001$). Among the TPB questionnaires' items, the ICC of knowledge, attitude, perceived behavioral control, subjective norms and behavioral intention was 0.81, 0.78, 0.72, 0.75, and 0.70 correspondingly. The Cronbach's alpha for the attitude structure, the perceived behavioral control, subjective norms, and behavioral intention and the overall Cronbach's alpha for the questionnaire were 0.8, 0.8, 0.73, 0.76 and 0.79, respectively.

Data collection

The questionnaire was first completed as a self- report in a pretest session by the participants in the intervention and non-intervention groups. The intervention program was then implemented for two months in four 45-60 min sessions per week on three groups of 23 to 25 individuals in intervention group. Interventions were based on the results obtained of pretest according on constructs of the TPB. Two intervention sessions were held by the gynecologist, and two other sessions were held by the main researcher. A booster session was then held in the fifth week to review the material and address the possible questions and challenges of the participants. A post-test was then taken from the intervention and non-intervention groups two weeks after the booster session. It should be noted that the non-intervention had not receive any trainings except for the routine antenatal educations delivered by the centers' staff. Objectives and sessions of the intervention included the below programs:

Session 1) Awareness-raising: raising awareness of the benefits of natural delivery and caesarean disadvantages by presentations, pamphlets, posters and booklets.

Session 2) Changing attitudes: By focus groups and in the presence of people who suffered from the complications of cesarean section.

Session 3 and 4) The effects on subjective norms and perceived behavioral control: by question and answer sessions held by two gynecologists, for pregnant women that had their mother or sister or a close friend in accompany in the classroom.

Session 5) Booster: The previous sessions were summarized. Also, pregnant women were encouraged to choose natural delivery if there is no medical reason.

One of the strengths of this study was participation of the gynecologist as health educator and contributing of people who had great impact on participants' intention (subjective norms), in sessions.
After delivery, to find the way of the delivery, researchers inquired by calling the participants, or reviewing their health record files.
There were some difficulties regarding the intervention such as persuasion of obstetrician to cooperate in the educational sessions; lack of a suitable place to hold classes in some health centers that made researchers to use a neighborhood mosque; and tiredness of pregnant women to attend the course until the sessions terminate, Thus, to fix the latter problem, participants were offered a 10-minute break and a reception.

Statistical Analysis

Variables of attitude, perceived behavioral control, and subjective norms were considered as independent and natural childbirth tendency as the dependent variable in this study. Data were analyzed by SPSS 22 software using descriptive statistics and paired t-test, independent t-test, Fisher's exact test, chi-square and McNemar's test.

Findings

The present research studied 140 primiparous women in two groups of intervention and non-intervention. The results of this research showed that the two groups were similar in terms of their demographic and obstetrical history and there was no statistically significant difference between them. The average age of the individuals in the intervention and non-intervention was, 26.2 ± 3.96 and 26.8 ± 4.36 (p=0.40), respectively. Of the individuals in the intervention and non-intervention group 61.4% and 55.7% had university education, 72.9% and 78.6% were housewives, and 17% and 24.3% had experienced abortion respectively. Given that the participants in the study were in their 5th, 6th and 7th gestational month, the results indicated that 55.7% of the individuals were in their 6th gestational month.
The demographic characteristics of the sample population are presented in Table 1. Among intervention and non-intervention group, the mean age was 26.2 and 26.8 year (p=0.40), 61.4% and 55.7% had a university education (p=0.41), 72.9% and 78.6% were housewives (p=0.38), 17.1% and 24.3% had abortion history (p=0.29), and 37.1% and 40% were in their 6th month of pregnancy (p=0.94), respectively. There were no significant differences in baseline measures between the groups.
According table 2, The mean difference in knowledge between the intervention and non-intervention groups was not significant (p<0.0001). The mean difference in attitude between the intervention and non-intervention groups was not significant (p= 0.75). The mean difference in perceived behavioral control between the intervention and non-intervention groups was significant (p= 0.04). The mean difference in subjective norms between the intervention and non-intervention groups was not significant (p= 0.11).
Based on the results in Table 3, behavioral intention was significantly different before the intervention among the intervention and non-intervention groups (p=0.017)
The Chi-square test showed that the behavior of the delivery method in both intervention and non-intervention group was not significant after the intervention (p=0.23) (Table 4).

Table 1- Characteristics of Intervention and Non- Intervention groups of the pregnant women who visited the healthcare centers in Sirjan in 2022

p-value	Non- Intervention group	Intervention group	Variable
	Prevalence (percentile)	Prevalence (percentile)	
0.40	Age		
	Mean ± SD	Mean ± SD	
	26.8±4.36	26.2±3.96	

	Education		
0.41	0(0)	2(2.9)	Illiterate
	4(5.7)	3(4.3)	Elementary-Secondary
	27(38.6)	22(31.4)	High school-Graduates
	39(55.7)	43(61.4)	University
0.38	**Occupation**		
	55(78.6)	51(72.9)	Housewife
	11(15.7)	11(15.7)	Employer
	2(2.9)	2(2.9)	University Student
	0(0)	4(5.7)	Self-employed
	0(0)	0(0)	Other
0.29	**Abortion History**		
	17(24.3)	12(17.1)	Yes
	53(75.7)	58(82.9)	No
0.94	**Month of pregnancy**		
	22(31.4)	23(32.9)	5
	28(40)	26(37.1)	6
	20(28.6)	21(30)	7

Table 2- Mean differences and standard deviations (SD) of before and after the intervention of the TPB'S constructs among women in both intervention and non- intervention groups.

Group / **Variable**	**Intervention group**	**Non-Intervention group**	**t-test**	**p-value**
	Mean ± SD	*Mean ± SD*		
Knowledge	2.75± 2.88	0.01 ± 2.12	6.40	p<0.0001
Attitude	0.06 ± 2.83	-0.06 ± 2.55	0.25	p= 0.75
Perceived behavioral control	0.88 ± 3.64	0.12 ± 2.73	1.38	p= 0.04
Subjective norms	-2.62 ± 3.56	-3.48 ± 2.68	1.60	p=0.11

Table 3 - Prevalence of behavioral intention before the intervention, among women in intervention and non-intervention groups

Behavioral Intention	**Intervention group**	**non-intervention group**	**p-value**
	Prevalence (%)	**Prevalence (%)**	

Probably C-section	28(40)	19(27.1)	p=0.017
Definitely C- section	14(20)	15(21.4)	
Probably natural	22(31.4)	16(22.9)	
Definitely natural	6(8.6)	20(28.6)	

Table 4- Prevalence of delivery method behavior in both intervention and non-intervention groups among women referred to Health Care Centers

Delivery method behavior (after the intervention)	**Non- Intervention group Prevalence (%)**	**Intervention group Prevalence (%)**	**p-value**
C- section	34 (48.6)	29 (41.4)	p=0.23
Natural	36 (51.4)	41 (58.6)	

Discussion

This study was carried out to encourage the primiparous women for choosing natural childbirth and decreasing the number of C-section with the help of TPB. In this study, some women choose natural child birth as delivery method behavior increased after the intervention. Although this change was statistically insignificant, one should be mindful of the difference between statistical and clinical significance. As C-section has several physical and psychological effects on mothers and families, it is also consuming and cost demanding, even preventing a handful of caesarean section that can be valuable.

In this study, demographic variables were distributed between the intervention and non-intervention groups homogeneously, thus it is not considered as a confounding factor in the intervention effect. The results of this study revealed that this theory is effective for increasing the perceived behavioral control of the women but any improvement was not achieved regarding their attitude, subjective norms and performance. The intervention had a positive effect on the score of the perceived behavioral control of the women. Our findings replicate and extend previous studies. In a study by Sargazi et al, the intervention increased perceived behavioral control of women. Likewise, Ahmadi et al. assessed the effect of educational program based on the TPB on primiparous pregnant women's knowledge and behaviors regarding breast feeding and observed an improved for perceived behavioral control of women [28, 29].

It is possible that the increase in this score in the present study is due to the presence of a gynecologist in the group discussion sessions that was effective in promoting women's confidence and their perceived behavioral control based on natural childbirth. The increase in perceived behavioral control confirms the effects of the intervention for developing the ability of women in increasing tendency to choose a natural delivery.

Although group discussions and several the intervention sessions held with the presence of some individuals who had suffered from C-section complications. The results did not show the effects on the individuals' attitude. These results are consistent with the results of the study conducted by Toghyani and Waldenstorm [30, 31]. They are however at odds with the results of the study conducted by Besharati and Jalali [32, 33]. The individuals' attitude towards certain behavior is the result of their assessment of favorable and unfavorable over time and depends on all the cognitive, emotional and behavioral reactions and the attitude towards an issue is the result of the sum of the individual ideas and beliefs on that issue or behavior [28]. To change someone's attitude, their beliefs should also change that can be hardly achieved in short time and this matter requires more interventions and a longer period.

In this study, there was a significant decrease in the subjective norms in the subjects after the intervention. The mean od score for this factor was also decreased in both the intervention and the non-intervention groups. Therefore, both groups performed similarly in decreasing the subjective norms. These results are close with the results of the study conducted by Taghdisi et al. [34]. A close examination of the normative beliefs and the subjective norms in the pregnant women showed that the individuals took their gynecologist and their husbands' decisions into

consideration while choosing the method of delivery, and the media had the least effect on their decision. Half of the trainings and the interventions in this study were provided by the gynecologist, the participants in the study mentioned that the physicians had the secondary influence in making their decision, and the primary influence on their decision making was the individual's decision, which was the resultant of being influenced by other norms (gynecologist, husband, mother, mother in law, family members, friends, books and media). Health care providers encourage women to choose natural delivery. In this study, as the subjects mentioned, more important were the social influence of the immediate family members or friends who had positive experiences with natural delivery, and then were approaching the date of delivery the researcher asked some of the participants (intervention and non-intervention) about their feeling towards childbirth and after recording their comments and thoroughly evaluating them concluded that approaching the date of delivery the individuals experienced more severe stress and pressure. They also believed that "no one understood their situation more than themselves and should decide and do something by their own". Therefore, the role of the family and friends were not perceived as important by the individual and consequently the individuals' decision and opinion on the subjective norms prevails. This can be one of the reasons behind the decrease in the average score of the subjective norms for both groups after the intervention. Therefore, despite the belief that intervention could affect the subjective norms, it did not actually happen. In case of the behavioral structure after the intervention, no significant change took place in neither of the two groups. The same results were obtained in some previous studies [35]. The current results were not consistent with Besharati et al., [32] who assessed the effect of education based on the theory of planned behavior in the choice of delivery method among 72 pregnant women in Rasht-Iran and showed that intervention improved women's performance significantly and encouraged women to choose natural delivery method.

Our intervention was done on a small scale and with its certain limitations, but it could increase the number of people who did the natural delivery in the intervention group compared to the non-intervention group which is clinically significant although not statistically significant. As the cesarean has a lot of physical and psychological effects on mothers, and demands time and cost for mothers and their families. Thus, it prevents even a small number of C-sections that can be valuable. It is necessary to note that intention might be affected by any of the attitude toward the behavior, or subjective norms or both factors, and consequently conversion of intention to behavior was prevented.

Due to the complexities, change in awareness does not always lead to change in attitude and changes in attitude since the individual may not show certain behaviors under the effect of the environment [35]. The delivery method behavior is strongly influenced by socio-cultural factors and women choose C- section under the effect of environmental factors, but not the clinical reasons [1]. Socio-cultural differences between communities and little awareness of the Iranian women of the pharmacological and non-pharmacological methods of labors' pain control may be the reasons behind the significant difference between the C-section percentiles in Iran compared to other countries. It is an indication of another causal relationship between women's awareness and the community's performance. Therefore, it should be noted that decreasing the number of unnecessary C- section operations requires the cooperation of four major groups: mothers, ministry of health and medical education, society specially the medical community.

The strength point of this study was a theory-based intervention and performed on an acceptable population size. The 80% power of this study could detect the mean score difference of the structures for a score of 6 and higher. Multistage random sampling, which considers all regions of the city, was applied. TPB can effectively be used in in increasing the primiparous mothers' perceived behavioral control but to improve attitude, subjective norms and performance, further studies are required to be performed assessing other effective factors.

Conclusion

The TPBwas effective in increasing the primiparous mothers' perceived behavioral control in this study; however, no improvements were made in primiparous mothers' attitude, subjective norms and performance. The obtained results can be given to experts, researchers, and health decision-makers for planning health behavior interventions.

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There is no conflict of interest to be declared.

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All authors contributed to this project and article equally. All authors read and approved the final manuscript.

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