



The Theory of Planned Behavior Application for the Delivery Method Selection in Primiparous Pregnant Women

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Authors

Hassanzadeh R.¹ MSc
Khaleghi H.^{1*} MSc
Manzaritavakoli Z.² MSc
Saeidinia A.¹ MSc
Namdar L.³ MSc
Askari Z.⁴ PhD
Bashi M.⁵ BSc

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¹Department of Health Education and Health Promotion, School of Health, Kerman University of Medical Sciences, Kerman, Iran

²Department of Midwifery Counseling, School of Nursing and Midwifery, Kerman University of Medical Sciences, Kerman, Iran

³Department of Medical Informatics Research, Faculty of Management and Medical Information, Kerman University of Medical Sciences, Kerman, Iran

⁴Department of Medical Research and Technology, Faculty of Medicine, Kerman University of Medical Sciences, Kerman, Iran

⁵Department of Science and Technology, Faculty of Medical Engineering and "Research Center in Medicine" Shiraz University of Technology, Shiraz, Iran

*Correspondence

Address: Department of Health Education and Health Promotion, School of Health, Kerman University of Medical Sciences, Haft Bagh Alavi Boulevard, Kerman, Iran. Postal Code: 7616913555

Phone: (343) 1325700
Fax: +98 (343) 1325218
hkhalleghi1979@gmail.com

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ABSTRACT

Aims The cesarean method is one of the most common surgical procedures among women in recent years. Lack of information and negative attitudes toward natural childbirth are the main 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 on natural childbirth tendency among primiparous women.

Materials & Methods This controlled interventional research with 140 primiparous women (n=70 women in each group) who attended the health centers in Sirjan City, Iran, in 2022, in their 18th to 30th month of pregnancy. A multi-stage sampling method was applied to select participants. The intervention was carried out based on the theory of planned behavior during four 45-60min sessions. A questionnaire was used for data collection before and after the intervention. The data was analyzed using the paired t-test, independent t-test, Fisher's exact test, and Chi-square test in SPSS 22 software.

Findings 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 The theory of planned behavior can be effective in reducing elective cesarean section among women under the study.

Keywords Childbirth; Pregnant Women; Theory of Planned Behavior; Pregnant Women

CITATION LINKS

[1] Affecting factors the choice of delivery and attitude of pregnant... [2] A good birth: Towards a new bioethical framework... [3] The effect of prenatal group education on knowledge... [4] Investigating some of the factors influencing choice of delivery type.. [5] Cesarean section delivery rates, determinants... [6] Indications and determinants of cesarean section: A cross-sectional... [7] The assessment of trend changes in cesarean delivery rate in private medical centers.. [8] The effect of education on base the... [9] Is a rising cesarean section rate inevitable... [10] Estimating the differences in Cesarean section (C-section) rates between public and privately insured... [11] Unnecessary cesarean section delivery causes risk to both mother and baby... [12] Factors influencing delivery method selection in primiparous pregnant women... [13] A survey on selection of delivery method by nulliparous pregnant women using health belief... [14] The process of women's decision making for selection of cesarean... [15] Midwives' views of an evidence-based... [16] Study of the effects of behavioral intention model... [17] Selection of mode of delivery and its related... [18] The psychological drivers of misinformation belief... [19] Health behavior and health education... [20] Modeling the theory of planned behavior to predict... [21] Effect of educational intervention based... [22] The application of the theory of planned behavior in preventing... [23] Factors related with tobacco smoking among college... [24] Health education and promotion theories... [25] Models of behavior... [26] Become an environmentally responsible customer... [27] Explaining adults' mental health help-seeking through... [28] Impact of educational program based on the theory... [29] Effect of an educational intervention based on the... [30] The effect of prenatal care group education on pregnant... [31] Antenatal fear of childbirth and its association with... [32] Effect of educational interventions based on theory of planned... [33] The effect of education based on the theory of planned behavior in promoting... [34] Performance assessment of Baznef model in health promotion... [35] Effect of educational intervention based on the theory of planned behaviour on the physical activities of...

Introduction

Delivery is a spontaneous process that does not need intervention and 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 and shorter hospital stays. 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 walls [7]. Nowadays, this method, which was only invented for emergency conditions and to save the mother's and child's life, has become a tool to escape the pain of childbirth, so 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]. 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 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 the C-section may lead to a lack of attention, providing complete care, and proper breastfeeding after childbirth [12]. One of the reasons behind the increase in the number of C-sections is non-medical and by mothers' request. C-section rate is less than 10% in 40% of the countries, between 10-15% in 10% of the countries, and more than 15% in 50% of the countries [13]. According to the statistics compiled by the Ministry of Welfare and Social Security, C-sections have 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-sections to be 10-15% of the total number of childbirths, and there 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, scientific indications do not determine the method of delivery; instead, ignorance, beliefs, behaviors, and wrong attitudes are determining factors [17, 18].

Patterns of behavior can be important in evaluating people's attitudes toward 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; and
- e) Subjective norms: The influential people in the individual's life expect people to act in certain ways [24].

This model indicates that two assumptions determine the individual's intention. One is a 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 the 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 gynecologists and researchers 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.

Materials and Methods

Research design and sampling

The present study is 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 the 18th to the 30th weeks of pregnancy. The study population was determined to be 62 individuals in each group based on a previous study [16] (the sample sizes increased by 15%, and there 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 sampled, and one center was randomly selected out of each cluster. Eventually, 6 centers were selected using simple random allocation, 3 centers were randomly determined as intervention and 3 centers as non-intervention

groups. From each center, 24 individuals were randomly selected to participate in the study. Inclusion criteria consisted of being 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, etc.), aged between 18 to 35 years old, and willingness to cooperate. The study's exclusion criteria included absence in sessions and classes more than one session. An appreciation gift was then given to the participants as an 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 the 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 on a 5-point Likert scale (from strongly agree to strongly disagree), and one question of subjective norms was multiple choice (four-option multiple choice questions). Finally, behavioral intention was assessed by one question. The validity and reliability of the questionnaire were evaluated in a similar study in 2014 [6]. The reliability of the questionnaire was evaluated by the 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 0.7, respectively. 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.

Research procedure

The questionnaire was first completed as a self-report in a pre-test session by the participants in the intervention and non-intervention groups. The intervention program was then implemented for two months in four 45-60min sessions per week in three groups of 23 to 25 individuals in the intervention group. Interventions were based on the results obtained from the pre-test according to constructs of the TPB. The gynecologist held two intervention sessions, and the main researcher held two other sessions. 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 received any training except for the routine antenatal education 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 cesarean disadvantages through 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;

Sessions 3 and 4) The effects on subjective norms and perceived behavioral control: Question-and-answer sessions held by two gynecologists for pregnant women who had their mother or sister or a close friend accompany them in the classroom; and

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

After delivery, researchers inquired by calling the participants or reviewing their health record files to find out how the delivery was made.

Statistical analysis

Data were analyzed by SPSS 22 software using descriptive statistics and paired t-tests, independent t-tests, Fisher's exact test, chi-square tests, and McNemar's test.

Findings

The two intervention and non-intervention groups were similar in terms of their demographic and obstetrical history; there was no statistically significant difference between them. The average age of 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 groups, 61.4 and 55.7% had a 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.

Among intervention and non-intervention groups, the mean age was 26.2 and 26.8 years ($p=0.4$), 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 (Table 1). The mean difference in knowledge between the intervention and non-intervention groups was not significant ($p<0.0001$).

Table 1. Comparing the frequency (numbers in parentheses are percentages) of the characteristics of intervention and non-intervention groups of the pregnant women who visited the healthcare centers in Sirjan City in 2022

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

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 ($p=0.11$; Table 2).

Table 2. Comparing the mean differences before and after the intervention of the TPB'S constructs among women in both intervention and non-intervention groups

Parameter	Intervention group	Non-intervention group	t-test	p-Value
Knowledge	2.75±2.88	0.01±2.12	6.40	<0.0001
Attitude	0.06±2.83	-0.06±2.55	0.25	0.75
Perceived behavioral control	0.88±3.64	0.12±2.73	1.38	0.04
Subjective norms	-2.62±3.56	-3.48±2.68	1.60	0.11

The behavioral intention of the intervention and non-intervention groups was significantly different before the intervention ($p=0.017$). The Chi-square test showed that the delivery method's behavior in both intervention (41.4% C-section and 58.6% natural) and non-intervention (48.6% C-section and 51.4% natural) groups was not significant after the intervention ($p=0.23$).

Discussion

This study was carried out to encourage primiparous women to choose natural childbirth and decrease the number of C-sections with the help of TPB. In this study, some women chose natural childbirth as a delivery method, and 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 the cesarean sections that can be valuable.

This study's demographic variables were homogeneously distributed between the intervention and non-intervention groups. Thus, it is not considered a confounding factor in the intervention effect. The results of this study revealed that this theory is effective in increasing the perceived behavioral control of women, but no improvement was achieved in 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 the perceived behavioral control of women. Likewise, Ahmadi *et al.* assessed the effect of educational programs based on the TPB on primiparous pregnant women's knowledge and behaviors regarding breastfeeding and observed an improvement in the 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, who was effective in promoting women's confidence and perceived behavioral control regarding natural childbirth. The increase in perceived behavioral control confirms the effects of the intervention on developing women's ability to increase their tendency to choose a natural delivery.

Although group discussions and several intervention sessions were held with the presence of some individuals who had suffered from C-section complications. The results did not show the effects on the individual's attitudes. These results are consistent with the results of the study conducted by Toughyani *et al.* [30] and Waldenström *et al.* [31]. They are, however, at odds with the results of the study conducted by Besharati *et al.* [32] and Jalali *et al.* [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, which can hardly be achieved in a short time, and this matter requires more interventions and a longer period.

This study showed a significant decrease in the subjective norms in the subjects after the intervention. The mean 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 to the results of the

study conducted by Taghdisi *et al.* [34]. A close examination of the normative beliefs and the subjective norms in 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 training 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 decisions, 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).

Healthcare providers encourage women to choose natural delivery. In this study, as the subjects mentioned, more important was 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 on their own". Therefore, the individual's role of family and friends was not perceived as important, and consequently, the individual's decisions and opinions on the subjective norms prevailed. 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 believing that intervention could affect subjective norms, it did not happen. In the case of the behavioral structure after the intervention, no significant change took place in either 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 a natural delivery method.

Our intervention was done on a small scale and with 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.

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 attitudes toward the behavior, subjective norms, or both factors, and consequently, the conversion of intention to behavior was prevented. Due to the complexities, a change in awareness does not always lead to a 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 sociocultural factors, and women choose C-sections due to the effect of environmental factors, but not clinical reasons [1].

Socio-cultural differences between communities and little awareness of Iranian women of the pharmacological and non-pharmacological methods of laborers' 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, the Ministry of Health and Medical Education, society, and especially the medical community.

The strength point of this study was a theory-based intervention 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 to increase primiparous mothers' perceived behavioral control, but to improve attitude, subjective norms, and performance, further studies are required to be performed to assess other effective factors. One of the strengths of this study was the participation of the gynecologist as a health educator and the contribution of people who greatly impacted participants' intentions (subjective norms) in sessions. There were some difficulties regarding the intervention, such as the persuasion of obstetricians to cooperate in the educational sessions, the lack of a suitable place to hold classes in some health centers, which made researchers use a neighborhood mosque, and pregnant women's tiredness to attend the course until the sessions terminated. Thus, to fix the latter problem, participants were offered a 10-minute break and a reception.

Conclusion

The planned behavior theory effectively increases primiparous mothers' perceived behavioral control but not attitudes, subjective norms, or performance.

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