Mohtasham Ghaffari[1] / Atefeh Afshari[2] / Sakineh Rakhshanderou[1] / Bahram Armoon[3]

Using theory of planned behavior for prediction of delivery mode among pregnant women: a theory-based cross-sectional research

[1] Environmental and Occupational Hazards Control Research Center, School of Public Health, Shahid Beheshti University of Medical Sciences, Tehran, Iran
[2] Health Education and Health Promotion, Isfahan University of Medical Sciences, Isfahan, Iran
[3] Infertility and Reproductive Health Research Center, Shahid Beheshti University of Medical Sciences, Tehran, Iran, Phone/Fax: +982122432040-41, E-mail: Bahramarmun@gmail.com

Abstract:
Background: Nowadays, in Iran cesarean rates have increased from the recommended level of the World Health Organization (WHO).
Objectives: The objective of the present study was to determine which theory of planned behavior (TPB) constructs predict intentions and delivery mode among pregnant women.
Methods: One hundred and four pregnant nulliparous women in their third trimesters of pregnancy referred to Semirom health care centers were investigated based on census reports. The data were collected by valid and reliable questionnaire based on the TPB constructs and analyzed by SPSS16.
Results: In examining predictors using linear regression analysis to choose normal vaginal delivery (NVD), all constructs of TPB, including attitude toward NVD ($p < 0.0001$), subjective norms ($p < 0.05$) and perceived behavioral control ($p < 0.001$) were significantly correlated. Finally, after telephone follow-up with the women who had delivered newborns on their delivery method, it was found that 71.15% had a NVD and 28.14% had a cesarean delivery.
Conclusions: Regarding the effect of attitude to NVD, subjective norms and perceived behavioral control in NVD intention and its crucial role in anticipating the final delivery method, it is recommended considering these constructs in designing educational interventions for safe delivery in the investigated area.

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Introduction

The process that birth occurs naturally is called normal vaginal delivery (NVD) [1]. Whereas cesarean delivery is defined as giving birth to a baby through cuts in the abdominal wall (laparectomy). In Iran the tendecy of women to opt cesarean deliveries rather than the NVD have increased 5%–15% for more than four decades which is more than european countries and WHO normal range [2], [3]. Every year 18.5 million babies are born worldwide [3]. In the latest figures released by the WHO in 2012, Cyprus has the highest (51%) cesarean rate, and Chad and Niger have the lowest (1%) during 2005–2010, while this rate was 40% for Iran [4]. According to statistics of Iranian Ministry of Health the cesarean rates in the major cities of Iran is 55%–60% and 44% throughout the whole country, much higher than the mean world rate (20%) [5]. It should be mentioned that cesarean delivery has side effects such as uterus infection, damage at the site of the operation, embryo death and cerebral damage [1]. The rate of death in cesarean delivery was 4–5 times higher than for NVD [6], [7].

Regarding the reported statistics and to achieve the acceptable cesarean rate recommended by the WHO, an investigation of determinants which cause the increase of this delivery method seemed necessary. Several factors have been mentioned as being predictive and determinants of delivery method selection [8], [9], [10], [11], [12], [13], [14], [15], [16], [17], [18], [19], [20], [21], [22], [23], [24], [25], [26], [27], [28], [29]. Some of the factors are as follows: psychological factors such as attitude to each delivery method, perceived support of husband, family and friends for delivery decision making [19], the behavioral intention of pregnant women and their husbands are predictive of delivery method [13]. Other factors such as perceived risk of NVD, perceived risk

Bahram Armoon is the corresponding author.

of cesarean delivery for the baby's safety as well as for the mother's next pregnancy [9], [11], [16], perceived benefits of each delivery method [11], [17], gynecologist's encouragement for NVD [17], perceived advice from gynecologists [12], [14], lack of awareness of the consequences of cesarean delivery [15], fear of NVD pain [12], [14], [15], experience of cesarean delivery within a family [8], women's feeling on their control on the decision making process [17] evaluation of different delivery methods, subjective norms, motives to comply [10], [18]. Also demographic social characteristics of pregnant women including economic status and social class, residence, age, employment and education level are other factors affecting delivery mode selection [8], [10], [18], [26], [28]. Despite the various studies on delivery mode selection factors, there is still no distinctive conclusion on the productiveness of theories and health behavior patterns in health education about decision making for delivery method. As the factors mentioned here are the main constructs in theory of planned behavior (TPB), in this study we aim to investigate this theory for delivery method prediction in pregnant women. This theory was introduced by Ajzen and Fishbin in 1970s. So,the attitudes, norms and control behavioral factors of people change for a behavior, also each of these factors may lead to improvement of behavioral intention [22]. This theory claims that behavioral intention is the main determinative of behavior and people check the issues facing them before making a decision to involve a given behavior. Attitude to behavior, subjective norms (confidence as to whether important relatives support the behavior as well as their motivation to comply) and perceived behavior control (confidence to facilitate factors or barriers and difficulty changing their behavior against these factors) affect intention [22], [24], [27].

Based on this theory, behavior intention and perceived behavior control affects behavior directly. As the determination of health behavior related factors, including safe delivery in TPB could be a function of educational intervention design. Also, in order to investigate the TPB framework in this study, complex human decisions and behavior were considered in the process of the research. In fact, this study could be assumed as a first step on the road to further perception of how some of the factors that affect attitudes toward NVD, subjective norms and perceived behavioral control, NVD might be related and also be targeted in interventions that study pregnant women and those planning their delivery mode. So, the objective of the present study was to determine which TPB constructs predict intentions and delivery mode among pregnant women.

Materials and methods

This cross-sectional study was conducted on pregnant women in their third trimesters of pregnancy who were referred to Semirom health care centers in Isfahan, Iran. The prerequisites of including individuals in the study were being in the third month of pregnancy, nulliparity and satisfaction of taking part in the study. According to the limited available population census sampling was selected. Informed consent was obtained from all individual participants included in the study. The data were collected from 104 pregnant women who were referred to Semirom City health care centers. The data collection tool was a research questionnaire based on TPB constructs (including behavior, delivery method, normal or cesarean delivery intention, attitude toward delivery methods, perceived subjective norms and perceived behavior control on each delivery method). In this study questionnaire validity was examined by face and content validity methods so that after preparation based on the literature, the questionnaire was reviewed by an expert in health education and by gynecologists. Internal consistency (Kronbach's α) was used for questionnaire reliability assessment. Reliability was measured by piloting the questionnaire on 30 pregnant women who were referred to Semirom city health care centers and calculation of Kronbach's α on different parts of the questionnaire. The individual in this pilot study did not include in the main investigation. Behavior, attitude construct was measured by behavioral beliefs, and evaluation of behavioral outcomes, including 16 questions (eight for each) with a 5-item Likert scale. This construct was measured with sum of multiple values of behavioral beliefs in evaluation of behavioral outcomes [23] with a minimum score of eight out of 200. The Kronboch's α for this scale was 0.73. The subjective norms construct were measured indirectly by normative beliefs, and motivated to comply, involving 10 questions (five questions for normative beliefs and five questions for motive to comply) with Likert 5 item scale. This construct was measured by multiplying the sum of normative belief point by motive to comply with minimum of five out of 125. The value of Kronbach's α was 0.79. The perceived behavioral control assessed indirectly via measuring, control beliefs and perceived power by six questions (three questions for each) with Likert 5 item scale. The recent construct assessed with multiplying control beliefs by perceived power point with minimum of three since 75. The α for this scale was 0.9. Behavioral intention was measured as three choices by both nominal qualitative variables and in some parts quantitative (point 2 for NVD, point 1 for no decision and 0 for cesarean). Questionnaires were filled out by pregnant women and data analysis was carried out using descriptive statistics, distribution indices, χ^2 tests, correlation and regression logistic in SPSS16. Also, informed and written consent

of mothers was taken in the study. After 3 months, telephone calls were made to follow up on the ultimate delivery method.

Results

The average age in pregnancy, and age when married of pregnant women in this study was 24.6 ± 3.8 and 21.9 ± 3.3. The education levels of most of the participants were university graduate level (31.7%) and high school diploma (30.8%). 84.6% of study subjects were housekeepers while majority of them stated their economic ability as average. In total, 28.8% of the study, individuals had cesarean intention, 54.8% had NVD intention and 16.3 had no decision. Finally, after telephone follow-up of pregnant women on delivery method, it was found that 71.15% had NVD and 28.84% had a cesarean delivery. Although there was a significant difference between the two groups there was no significant difference from other demographic and social features. The value and comparison of each TPB constructs in the two mentioned groups have been presented in Table 1. Based on our results, there was a significant difference in behavior intention ($p = 0.001$), attitude to delivery methods ($p = 0.02$), and perceived behavioral control ($p = 0.001$) between two groups. The results also showed that all three approaches, including attitude ($p < 0.001$), subjective norms ($p < 0.05$) and perceived behavior control ($p < 0.001$) are predictive of NVD intention. Among the behavior intention construct and perceived behavior control that have a direct effect on final delivery method, the NVD intention construct had a significant predictive role ($p < 0.05$, OR = 2.41, R = 0.6). The correlation between TPB and productiveness findings of TPB constructs for behavior intention and delivery method is presented in Table 2–Table 4. These relations could show as below formulas:

Table 1: Frequency distribution of each theory of planned behavior constructs.

	High level F (%)	Mid level F (%)	Low level F (%)
Attitude	15 (14.4)	80 (76.9)	9 (8.7)
Subjective norms	12 (11.5)	61 (56.7)	31 (29.8)
Perceived behavioral control	20 (19.2)	53 (51)	31 (29.8)
NVD intention	57 (54.8)	17 (16.3)	30 (28.8)

Table 2: The correlation between theory of planned behavior constructs and behavior.

	Behavior (delivery method)	Intention	Perceived behavioral control	Perceived subjective norms	Attitude
Attitude					–
Perceived subjective norms				–	18.0
Perceived behavioral control			–	0.35[a]	0.58[a]
Intention		–	0.72[a]	0.39[a]	0.63[a]
Behavior (delivery method)	–	0.38[a]	0.29[a]	0.05	0.22[b]

[a]Significant correlation in $p < 0.001$. [b]Significant correlation in $p < 0.05$.

Table 3: Prediction of NVD intention based on theory of planned behavior.

Variables	p-Value	Beta	B of standard error	B
Constant (a)		–	0.243	−1.02
Attitude	$p < 0.001$	0.317	0.002	0.01
Perceived subjective norms	0.01	0.166	0.003	0.007
Perceived behavioral control	$p < 0.001$	0.486	0.004	0.025

Table 4: Prediction of selected delivery mode based on the intention and perceived behavioral control.

Variables	95% CI for OR	OR	p-Value	B
Constant (a)		0.75	0.55	−0.28
Perceived behavioral control	0.96, 1.04	1.006	0.75	0.006
Intention	1.12, 5.18	2.41	0.02	0.881

NVD selection intention = −1.02 + 0.01(attitude) + 0.007 (perceived subjective norms) + 0.025 (perceived behavioral control).

Likely to choose NVD/Likely to choose CS = −0.28 + 0.881 (NVD intention).

As the equation shows, NVD intention increase is directly affected by increase in attitude, subjective norm and perceived behavioral control. Also with increase in NVD, the probability of NVD rises compared to cesarean delivery. The result of regression analysis and beta coefficients of the TPB constructs has been represented in Figure 1.

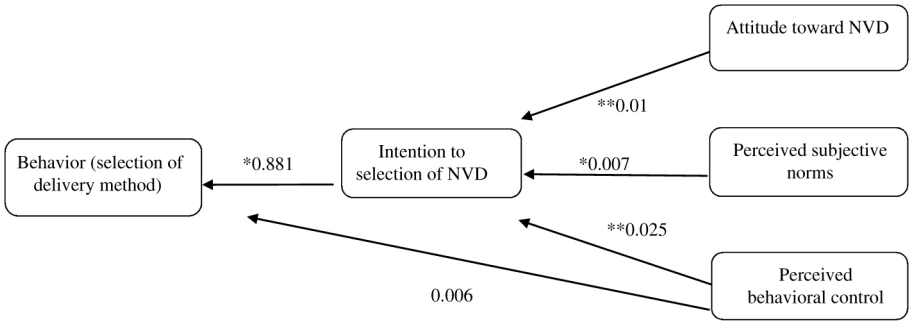

Figure 1: Results of regression analysis and beta coefficient for theory of planned behavior (n = 104).
*Shows p < 0.05 and **shows p < 0.001.

Discussion

In this study 71.15% of studied women had NVD and 28.84% had cesarean delivery. This shows that the cesarean rate in the studied area is higher than the WHO recommended rate. Perhaps time spent in healthcare when pregnant, gynecologist's attitude and socio-cultural conditions are among the reasons. The results revealed attitudes toward delivery methods, perceived subjective norms by husband, gynecologists, family and friends and also perceived behavior control of pregnant women against NVD such as insistence by husbands and gynecologists as determinant of NVD. With the increase of positive attitudes towards NVD, the NVD increases. In a study on prediction of NVD intention, Smart found that women with positive attitudes had three times more intention for NVD and those with negative attitudes towards cesarean delivery had more intention towards NVD [19]. The study on prediction of birth delivery with Lamaz technique showed that the best predictor is attitude [13]. Fathian et al. [21] prove our results regarding the relationship between the intention and attitude. With regard to role of attitude in NVD selection, increase in positive attitude towards NVD seems necessary in educational interventions for increasing NVD.

Subjective norms are predictive of behavioral intention. So, the more pregnant women are encouraged by relatives and follow their advice, the more intention there would be for NVD [25]. Hence family advice could be among the reasons for tendency to NVD as some of the participant have already stated. In the study on women with previous experience, Disney stated that social support and healthcare affects the selection and decision making in delivery method [9]. The results of studies by Fardi and Jafari, Fathian et al. and Ridley et al. are in line with the present study [8], [10], [12], [14], [15], [17], [18], [20], [21], [22], [23], [24], [26], [27], [28]. Nevertheless considering the role reference people play in pregnant women's decision for promoting safe delivery is necessary.

In this research it was found that perceived behavioral control predicts the NVD intention but not the behavior. In a study on effective factors on NVD selection in women with previous cesarean deliveries, Ridley and coworkers showed that the women's feeling on control in the decision making process of NVD after a prior cesarean affected their intension [17]. Perhaps the disadvantage of this construct on delivery method prediction unlike the results of previous studies is due to nulliparity and lack of experience. Moreover gynecologist and family affect the decision making of pregnant woman as well.

There was a significant relationship between pregnant women's tendency to delivery method and consequence of delivery [18]. In this study a significant direct relationship also was observed between intention and

behavior of NVD. Lowe and Frey showed a similar result to our current study in delivery prediction with a relaxation technique using rational action. They showed that behavioral intention of pregnant women and their husbands is predictive of relaxation technique delivery [13]. Chu et al. [29] found that preference and intention for cesarean delivery is a predictor of cesarean delivery. One of the strong points of this study is the data set that was obtained from a national population of Iranian pregnant women of each province. Also this study could be a guide for planning and interventions for health policy makers. However, it is important to emphasize that since the study is a cross-sectional design, the causal relationship between delivery mode and intention to NVD could not be directly investigated. Besides, the data may be subject to recall and social desirability bias because we relied on participant self-reports.

Conclusion

In this study the attitude, subjective norms and perceived behavioral control were effective in NVD and the intention was predictive of delivery method in pregnant women. Hence, these constructs are useful in relevant educational interventions designed to decrease cesarean section rates and understanding the decision process and ultimately a safe delivery method and ability of pregnant women. One of the limitations of this study was the small sample size of surveyed individuals. Also, the selected theoretical framework of this study did not involve all effective constructs such as awareness. Changing the theoretical framework and/or combining the framework with the role of other constructs can be investigated.

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Compliance with ethical standards

Conflict of interests: All other authors had no conflicts of interest to be declared.

Informed consent: Informed consent was obtained from all individual participants included in the study.

Ethical approval: All procedures performed in studies involving human participants were in accordance with the ethical standards of the institutional and/or national research committee and with the 1964 Helsinki Declaration and its later amendments or comparable ethical standards. This study was approved by the Ethical Committee of Shahid Beheshti University of medical sciences (code:116).

Authors' contributions: MGh and BA helped in study design. SR and AL helped in analysis and interpretation of data. AA and BA drafted the manuscript. SR and MGh helped in critical revision of the manuscript.

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