



The Effects of Social Support on Pregnant Women's Choice of Delivery Method: Application of an Expanded Theory of Planned Behavior

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Abstract

Objectives: The theory of planned behavior (TPB) has been used in pregnant women's choice of delivery method and other health-related behaviors. This study extended TPB to predict the role of social support in pregnant women's choice of delivery method.

Materials and Methods: This prospective cohort study was conducted on pregnant women referred to Fatimah hospital in Hamadan, Iran, from 2015 to 2016. A total of 206 nulliparous pregnant women, who referred to Fatimah hospital, completed a self-report questionnaire including measures of intentions, attitudes, subjective norms, perceived behavioral control and social support. These women were followed up until the end of their pregnancy.

Results: On the basis of structural equation modeling, adding social support variable improved the indices of the model slightly, but this variable cannot be regarded as a predictor of behavior. A gap between intention and behavior and other factors together with social factor may be the reason. The perceived behavioral control of the individuals was a significantly effective predictor for selecting the type of delivery.

Conclusions: Attitude, subjective norms, perceived behavior control, and social support were distinguished as significant predictors of the choice of delivery type. Therefore, it seems that designing an intervention with emphasis and focus on making changes in these variables and considering different dimensions of social support can increase people's intention towards natural delivery by providing facilities in the childbirth environment.

Keywords: Social support, Theory of planned behavior, Women's choice of delivery method

Introduction

The high rate of caesarean section delivery has become a critical public health issue worldwide (1,2). While less than 15% has been considered as the ideal rate for caesarean section (3), a recent longitudinal analysis of data from 121 countries showed that currently about one-fifth of all babies are born by cesarean section and the global average cesarean section rate has increased by about 12.4% between 1990 and 2014 (4). Iran has been ranked among the countries with high rates of cesarean section. The results of a study by Azami-Aghdash et al showed that the global prevalence of caesarean section in Iran is 48% (5). This is about three times more than the global standard.

There are evidences suggesting that, in addition to agents related to the health care system and health care providers' preferences, maternal preference might play a distinct role

in the mode of delivery (6). For example, Fuglenes et al asked pregnant women at 30 weeks of gestation to state their preference for delivery mode, and then followed them up to determine the association between stated preference and actual delivery route. The results of the study indicated that 88% of women with vaginal preference delivered their baby vaginally (7). Women's preference and intention may be affected by several factors including socio-cognitive determinants. Exploring and recognizing these factors is important to find solutions and develop more effective policy and programs. In this regard, theory of planned behavior (TPB) provides a parsimonious and useful framework to understand the factors influencing individual's intention and behavior in a variety of settings (8). Based on this theory, mother's intention is expected to influence the choice of natural vaginal delivery (NVD). The intention, in turn, is influenced by the degree to

Received 23 September 2017, Accepted 2 January 2018, Available online 22 January 2018

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which pregnant woman has a desirable evaluation of NVD (attitude), the belief that significant others would approve NVD (subjective norms), and how much control she thinks she has over delivering naturally (perceived behavioral control).

Although, there is a limited application of TPB to predict intention and actual delivery mode, there are a few investigations suggesting the important role of TPB constructs in explaining the reasons underlying pregnant women's preference for delivery mode (9-12). For example, Edmonds et al reported on the pregnant women's attitudes towards childbirth and the degree of confidence in coping with a vaginal birth as predictors of their delivery preference (9). In addition, in a study done by Shams et al, subjective norms were identified as a determinant of pregnant women's intention towards cesarean section (11).

In their meta-analysis, Armitage and Conner demonstrated that TPB constructs accounted for 27% of the variance in behavior and 39% of the variance in intention (13). In other words, the amount of unexplained variance in behavior and intention are about 70 and 60%, respectively. To improve predictive power, the TPB is open to the inclusion of additional variables (8). In this study, an expanded TPB was used by including the social support. Social support can be defined in two broad categories: structural and functional. The structural form of social support is related to group memberships and functional social support refers to advice and emotional support. Previous studies have documented the relationship between social support and health outcomes (14). Regarding delivery mode, these investigations are usually focused on the relationship between social support and pregnancy outcomes such as quality of life and depression (15), whereas some previous studies argued that social support can play an important role in the delivery mode choice (16). On the other hand, due to feasibility and cost-effectiveness, it seems that promoting or strengthening social support would be an appropriate intervention strategy to reduce cesarean section rate. In this regard, several possible mechanisms have been suggested, including change within the neuroendocrine system, improving the psychological welfare and reducing response to stress (17-20). Despite these assumptions, there are mixed findings on the relationship between social support and delivery mode. While studies such as that reported by McGrath and Kennell showed that cesarean section was lower among pregnant mothers who received care with social support (21), there was no relationship among social support and the odds for cesarean delivery. Interestingly, based on some point estimates, she noted that association might be in the opposite direction (22).

Majority of these previous studies applied the TPB to predict intention and preference for delivery mode rather than the actual delivery route. This study aimed to evaluate the expanded TPB for predicting pregnant

women's intention to deliver vaginally and their actual delivery mode.

Materials and Methods

Setting and Study Design

The study was conducted on pregnant women referred to Fatimah hospital in Hamadan, Iran, from 2015 to 2016. Hamadan is the capital city of Hamadan province with a population of about 600 000 people which is located in the west of Iran. Participants were recruited using random sampling. The cesarean section rate in Hamadan province in 2014 reached 47.8% (23). The study was done with a sample size of 206 considering $\alpha = 0.05$, $\beta = 0.20$ and mean (SD) 80.22 (14.03) (24). The subjects were selected from pregnant women referred to Fatimah hospital during the study. This hospital is a referral center for pregnant women in the city in which almost 10 000 deliveries occur annually. Pregnant women who were nulliparous, with the gestational age of 20 to 23 weeks, uncomplicated pregnancy and without any indication for cesarean section were included. These women were followed up to determine the type of delivery

Study Instruments and Measures

The data collection tool was a self-administered questionnaire adopted previously by Besharati et al (24). The questionnaire was revised and validated by the researchers. For this purpose, a literature review was done and a pilot study was carried out on 20 pregnant women (nulliparous, with gestational age of 20 to 23 weeks). The readability of the questions was asked of the women and the data regarding their opinions were collected. Then, some questions were deleted. For calculation of the content validity, a panel of professional experts (consisting of 10 faculty members of Hamadan University of Medical Sciences, including 7 experts with a PhD degree in health education and promotion and 2 reproductive health specialists and 1 gynecologist) reviewed the necessity and the relevance of items. The necessity and relevance of the questions were determined. The experts' comment about the content validity index (CVI) and content validity ratio (CVR) of each question were considered. In addition, an open-ended question was asked to elicit the opinions of experts on each item. The questions with CVR less than 0.62 and CVI less than 0.78 were omitted. In the present study, the total CVI and CVR of the scales were 0.80 and 0.83, respectively (25). To estimate the reliability of the scales, a test-retest study was conducted with a 4-week interval. The intra-class correlation coefficient (ICC) and Cronbach alpha coefficient were 0.84 and 0.89, respectively (25).

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The questionnaire consisted of 2 parts: The first

part determined demographic characteristics of the participants, including the age of the women and their husband, their educational level, job and so on. The second part measured 4 constructs of TBP and social support.

The second part contained 14 items including attitude (4 items), subjective norms (3 items), perceived behavioral control (3 items), intention (2 items) and social support (7 items) which were graded from 1 to 5 according to Likert scale (strongly agree, agree, no idea, disagree, strongly disagree).

Statistical Analysis

The descriptive analysis was done using SPSS (23) software. Using AMOS (23), the confirmatory factor analysis (CFA) and the structural equation modeling (SEM) were applied for TPB in women's choice of delivery methods. Testing Hypotheses about the interrelations of latent and observed variables was performed using SEM (26).

In the measurement model with attitude, subjective norm, behavioral control and intention factors ($\chi^2 = 58.019$, $Df = 39$, $CFI = 0.922$, $NNFI = 0.890$, $RMSEA = 0.049$), the results showed a good fit (27). Construct validity and reliability were also assessed utilizing a number of indices. The initial assessment of the measurement model based on construct validity (convergent and discriminant validity) showed that one item addressing behavioral control and four items addressing social support constructs (model 2) were excluded since $CR < 0.7$, $AVE < 0.5$ and $ASV > AVE$. After deletion, the indices were appropriate. These indices were used for the evaluation of the goodness of fit of the models. All of the indices have been explained in Table 1 (26,28,29).

In addition, 2 important criteria utilized to measure the power of the relationship between latent variables in structural models were as follows: the path coefficient and

their significance.

Results

Data were obtained from 206 pregnant women who were admitted to the Fatemeh hospital in Hamadan. For all the women, gestational age was reported to be more than 20 weeks. Majority of the women (80.6%) were housewives and about 50.8% wanted to have a midwife. Other demographic variables are demonstrated in Table 2.

Two direct models of the TPB were evaluated. The main purpose was to compare the two models (including social support variable and without it) and whether the use of the model with social support is appropriate or not.

The result showed that in model 1 (Figure 1), factors of attitude ($\beta = 0.23$), subjective norms ($\beta = 0.46$) and perceived behavioral control ($\beta = 0.27$) have a significant direct effect on intention. However, the effects of intention ($\beta = -0.083$, $P > 0.05$) and perceived behavioral control ($\beta = -0.014$, $P > 0.05$) on behavior were not significant. By adding the social support construct to Model 1, the results in model 2 (Figure 2) showed that this construct ($\beta = 0.17$) directly affected intention but did not have a significant effect on behavior ($\beta = -0.10$). The R-square of the model, including social support, was not much more than that of the model without social support, but according to indices, the model including social support is more appropriate. All the indices also indicated a good fit for the two models (Table 3).

The results showed that 84% of mothers had planned to have a natural delivery. After following mothers and identifying their delivery type, it was revealed that 41% had a natural delivery and 59% had a cesarean section. In other words, almost half of 84% of the mothers who intended to have a natural delivery had successful natural delivery.

Table 1. The Results of SEM of 2 Models (With and Without Social Support Variable)

	Construct	CR	AVE	MSV	ASV	Cronbach α
Model1	Attitude	0.859	0.610	0.304	0.241	0.688
	Behavioral Control	0.922	0.855	0.304	0.211	0.713
	Subjective Norms	0.808	0.678	0.484	0.313	0.895
	Intention	0.951	0.907	0.484	0.364	0.904
		RMSEA	CFI	NNFI	$\chi^2(df)$	$\chi^2/(df)$
		0.05	0.92	0.89	56.487(38)	1.486
Model 2	Attitude	0.854	0.602	0.285	0.193	0.844
	Social Support	0.710	0.505	0.386	0.211	0.785
	Behavioral Control	0.899	0.818	0.221	0.157	0.713
	Subjective Norms	0.733	0.585	0.497	0.913	0.904
	Intention	0.904	0.826	0.497	0.342	0.895
		RMSEA	CFI	NNFI	$\chi^2(df)$	$\chi^2/(df)$
		0.04	0.95	0.93	92.433(67)	1.380

Abbreviations: CR, Constructing reliability; AVE, average variance extracted; MSV, Maximum shared squared variance; ASV, Average shared squared variance; RMSEA, root mean squared error of approximation; CFI, comparative fit index; NNFI, non-normed fit index.

Table 2. Demographic Characteristics of the Survey Participants (N = 206)

Variables	Levels	No. (%)	
		Male	Female
Age	<20	2(1)	4(1.9)
	20-30	74(35.9)	138(67)
	30-40	107(51.9)	59(28.6)
	40-45	23(11.2)	5(2.4)
Education	Illiterate	6(2.9)	5(2.4)
	Lower high school	25(12.1)	37(18)
	Diploma	65(31.6)	78(37.9)
	Higher education	110(53.4)	86(41.7)
Job/Female	Housekeeper	166(80.6)	
	Having a business	40(19.4)	
Job/Male	Unemployed	5(2.4)	
	Worker	27(13.1)	
	Employee	69(33.5)	
	Self-employed	105(51)	
Doula	Yes	120 (58.3)	
	No	86(41.7)	
Midwife	Yes	113(54.9)	
	No	86(41.7)	

Table 3. The Results of Estimated Coefficient of Factors in 2 Model of TPB

		Model1	Model2
Attitude	→ Intention	0.23**	0.19 *
Subjective norms	→ Intention	0.46**	0.37 **
Perceived behavioral control	→ Intention	0.27**	0.30**
Social support	→ Intention	-	0.17*
Social support	→ Behavior	-	-0.10
Intention	→ Behavior	-0.083	0.03
Perceived behavioral control	→ Behavior	-0.014	-0.06
R ² (squared multiple correlation)		0.61	0.64

Discussion

This study aimed to explain the intention and behavior of choosing the type of delivery based on an expanded TPB in pregnant women referred to childbirth preparation classes in the city of Hamadan.

The results of this study indicated that the majority of the participants (84%) intended to have a natural delivery. In other studies, most mothers also said they were going to have a natural delivery (7,30,31). For instance, in a study conducted by Fuglenes et al (7) on Norwegian women and a study carried out by Abdolkarimy et al (30) in Urmia, investigating women’s intention for delivery based on the TPB, it was revealed that 84 and 68% of the mothers intended to have a natural delivery, respectively.

The findings showed that TPB was able to explain 61% of

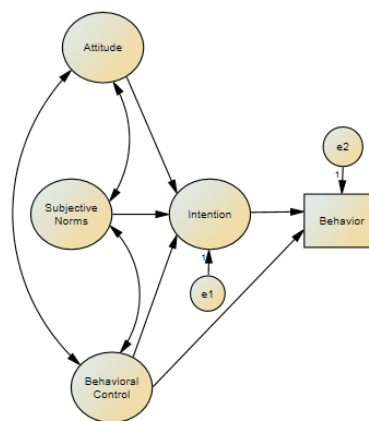


Figure 1. The SEM Model for TPB.

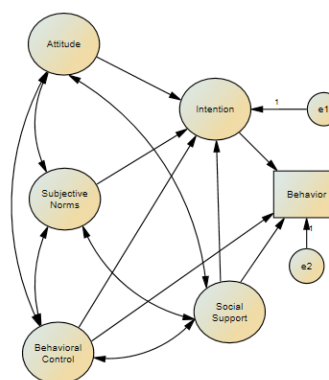


Figure 2. The Proposed Model for Extended TPB With Social Support Factor.

the variance in the intention to choose the type of delivery through variables such as attitude, subjective norms and perceived behavior control in pregnant women. This finding is different from that of other studies which have determined intention to choose a type of delivery based on behavioral theories (12,32). For example, in the study conducted by Soheili et al (12) based on TPB, the findings showed that the model was able to predict approximately 14% of the variance of the intention to choose the type of delivery.

In this study, TPB was extended to increase predictive power by adding social support variable. Social support is a multi-dimensional concept. It is considered as a source provided by others in the context of pregnancy to deal with stress, anxiety and fear of labor pain (33). Social support maintains health and promotes healthy behaviors (34). Studies have shown that some aspects of social support, including emotional and informational support, are related to the choice of delivery type (16).

The results indicated that with the addition of social support, the model could predict about 64% of the variance of the intention to choose the type of delivery,

in other words, this variable could only add 3% to the theoretical prediction. In various studies, in behaviors such as exercising, adding social support could increase the intention prediction (35,36).

In this study, the teacher of the childbirth preparation classes and the doctor were the main sources of social support for the participants. These individuals seem to be able to contribute to the intention to choose the type of delivery by providing a variety of social support including instrumental, informational and emotional support. This result is consistent with other studies in this regard. As stated by the British Society for Pregnancy and Neonatal Care in recent years, the most important way to reduce and balance the frequency of cesarean section is to raise the level of awareness of mothers and to reduce their fear of childbirth while increasing their trust in the health system. It also states that the doctor and health care staff are responsible for these trainings (37,38).

This study showed that perceived behavioral control was effective as a predictive factor in the choice of natural delivery as a preferred method in pregnant women. Perceived behavioral control shows how much a person feels that a behavior is controlled by her will. This finding is similar to that of other studies (10,39). In this study, women's attitude towards delivery predicted their delivery intention. More positive attitudes of women towards the natural method led to a reduction in the choice of cesarean. In different studies, higher scores in attitude were effective in choosing the type of delivery and are consistent with the current study (11,30,40).

The results of the current study showed that 41% of the mothers had a natural delivery and 59% had a cesarean section. In other words, almost half of 84% of the mothers who intended to have a natural delivery had a successful natural delivery. In a study conducted by Fuglenes et al on Norwegian women, out of 84% of mothers who intended to have a natural delivery, 72% were successful (7). In a study conducted by Wu et al in the State of California, out of 74% of mothers who intended to have a natural delivery, 87% were successful (41). The heterogeneity of the results seems to be justified by cultural differences, childbirth environment and health policies in European and American countries.

The results of this study show that, despite the proposed TBP, intention and control of perceived behavior did not predict the type of delivery in pregnant women. The results of the study conducted by Shahraki Sanavi et al in Zahedan are not consistent with that of the present study due to the type of the study and educational intervention (42).

In many studies, the gap between intention and behavior has been documented (35). The TPB has the most successful application for behaviors that are under the intentional control of an individual (36). If the behaviors are not entirely under the intentional control of the individual, even when she is strongly influenced by her

own subjective norms and attitude, she may not behave due to the interference of environmental conditions. In choosing the type of delivery, in addition to the individual's internal variables, environmental factors are important. In past studies, some of these factors, including doctor and midwife, place of birth, painless delivery facilities, financial affairs, insurance and policies of care system were identified (43-47).

It has also been mentioned in various studies that planning is a simple way to fill the gap between intention and attitude (35,48). Planning is necessary to choose the type of delivery but it is not enough. The control of action in planning is a key variable to fill the gap between intention and behavior when facing different situations. Therefore, coping planning interventions are effective when participants are supported in the process of creating coping programs.

It seems that social support, including mental/emotional support and informational support can affect the choice of delivery in pregnant women. Therefore, in an effort to better explain the behavior of choosing the type of delivery, in this study, social support was added to TPB. However, the results of this study indicated that social support was not a significant predictor of the type of delivery.

Various studies on behaviors such as exercise (36) showed that adding social support to the TPB model led to a direct effect of this determinant on intention or behavior, but in the current study, social support had a significant relationship with intention, but it did not have a significant relationship with behavior. Based on the findings of the present study, the following possible reasons can be proposed: First, social support measurement may not be appropriately carried out. In the initial version of the questionnaire, social support measurement included both structural and functional dimensions, but in the structural equation model based on the obtained indicators, some social support questions were eliminated. Therefore, the measurement does not seem to cover all the aspects of social support. Secondly, based on the results of various studies (35), if the compensatory, interventional and synergistic effects of social support are combined with other variables of TPB, the effect of prediction of social support on the conduct of behavior could be better demonstrated.

As mentioned, health policies can also influence the process of cesarean section and promotion of natural delivery. A study that was conducted in Chicago in order to determine the effect of departmental policies on cesarean section revealed that after changing the departmental program in terms of approach to cesarean section, the total cesarean section rate decreased by providing painless delivery facilities (49).

In various studies, the establishment of supportive environments and the promotion of midwifery and physician's skills are considered to be effective in increasing

the choice of delivery type (44). Therefore, any planning at the macro level with the goal of extending natural delivery will be successful if the social factors affecting them and especially midwives and obstetricians are considered, in addition to focusing on effective personal factors, in the pregnant women's decision regarding the type of delivery (knowledge, attitude and perceived behavior control). Also, the development of education by midwives and other health care personnel based on the educational needs of mothers should be considered, and by providing the necessary training in choosing the type of delivery and expressing the benefits and complications of any delivery method, and the provision of painless delivery facilities, the rate of cesarean section which imposes a huge amount of costs on the health system will be reduced.

The limitations of this study included the setting from which the mothers are chosen; since it is an Educational Hospital and the only specialist center for women in Hamadan, it cannot represent all women in the community. Moreover, although the final outcome was measured observationally, the variables of TPB were self-reported and the results were affected by the measurement bias.

Conclusions

The results showed that the use of the expanded TPB for predicting pregnant women's intention to deliver vaginally is appropriate.

Attitude, subjective norms, perceived behavior control and social support were distinguished as significant predictors of the choice of delivery method. Therefore, it seems that designing an intervention with emphasis and focuses on making changes in these variables and considering different dimensions of social support can increase people's intention towards natural delivery by providing childbirth environment facilities.

Acknowledgements

This study has been adapted from a PhD thesis carried out at Hamadan University of Medical Sciences. We appreciate Hamadan University of Medical Sciences for financial support we received in conducting this study. In addition, we appreciate the manager and staff of Fatemeh hospital who helped us in all the stages of our study.

Conflict of Interests

There is no conflict of interest to be declared.

Ethical Issues

Informed consent forms were obtained from all subjects participated in the study. The Ethics Committee of Hamadan University of Medical Sciences concurred with the study protocol (IR.UMSHA.REC.1394.399). Moreover, PhD thesis was registered in the national registry of clinical trials (<http://www.irct.ir>; identifier: [IRCT201512169014N86](https://doi.org/10.1186/1745-6215-12169014N86)).

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