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Modeling the Intention to Choose Natural Vaginal Delivery: Using Reasoned Action and Social Cognitive Theories

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ABSTRACT

Background: The Behavioral Intention Model is one of the best and most widely models used regarding attitude of behavioral of pregnancy and decrease the rate of cesarean section (CS) among pregnant women, except effect of attitude and subjective norms on behavioral intention. Two variables of self-efficacy, and outcome expectation, relate to individual's behavior in an upcoming situation, and both of them are important at the development of behavior. The purpose of the present study was to develop a model to explain women's intention to choose natural vaginal delivery (NVD). The variables of self-efficacy and outcome expectations, derived from Bandura's Social Cognitive Theory, and Behavioral Intention Model constructs were used to define the model.
Methods: The study was descriptive and cross-sectional in nature and took place in Pars Abad, Iran in 2014. The non-probability sample consisted of 200 pregnant women who voluntarily participated in the study and provided the data. SPSS 21 and MPLUS 6.8 were employed to analyze the data.
Results: Self-efficacy, outcome expectations, and attitude toward NVD were associated with intention to choose the NVD.
Conclusion: The study findings may play a role in designing educational interventions aimed at influencing the NVD and improving childbirth programs.

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Introduction

Natural vaginal delivery (NVD) is the most secure and safest delivery method in the majority of cases for both the mother and the infant,[1] while cesarean section (CS) is generally considered as an alternate when NVD is not possible to protect both the mother and infant.[2] Although CS has become increasingly safer in the last century, it cannot replace NVD in terms of low maternal mortality and less cost,[3] because the maternal mortality rate associated with CS is 4-10 times higher.[4]

Since the 1970s, the CS rate has increased in many parts of the world,[5,6] and depending on the population and the facilitates, the CS rate differs in developed and developing countries.[3] The CS rate in the United States has increased from 4.5% in 1965 to 32.9% in 2009,[2,7] in England from 12.5%

in 1990 to 21.4% in 2004,[8,9] in Italy from 10.2% in 1980 to 33.2% in 2000,[10] while the highest reported rate of CS was for Brazil with about 50%.[11] Additionally plenty of research evidences also exist to suggest steady increase of CS in Iran, for instance from 35% in 2000 to 48% in 2009[6,12] and from 45.2% in 2003 to 58.6% based on the findings of another study in in the Ardebil province, North West of Iran.[13,14]

In comparison to NVD, CS has more complications, including uterine infection, fever, severe abdominal wall wound after the surgery, abdominal infection, bleeding, anesthesia complications, urinary system damage during surgery, venous thrombosis in legs, higher expenditure, and increased maternal mortality rates,[10] increase in the risk of maternal and perinatal morbidity, thromboembolism, postpartum depression,[4] and feeling of dissatisfaction related to the birth and poor body image and lower self-steam.[15]

The literature suggests that the Behavioral Intention Model (BIM), which is based on the Fishbein and Ajzen's Theory of Reasoned Action,[10] is one of the best and most widely used models in investigating pregnancy-related behaviors. In this model, intention for the behavior is the most important determinant, which is a combination of attitude toward behavior and subjective norms.[5,10] The attitude towards the behavior includes beliefs and positive or negative expected value of personal consequences of behavior performance. The subjective norm is another factor and consists of normative beliefs as well as motivation for obedience.[10,16]Kashfi et al. assessed the effects of BIM-based education on decreasing the rate of CS among pregnant women and reported that the intervention was effective in increasing the pregnant women's knowledge, evaluation of the outcomes of NVD, attitudes toward NVD, strengthening pregnant women's NVD intention as well as performance.[10]

Additionally, the two variables that represent expectancy of self-efficacy, which is a person's belief on own ability to successfully perform a task,[17] and outcome expectations, which is judgments about the likely consequences of the behavior,[18] are considered to be instrumental in the development of the behavior.[19] Self-efficacy can affect and determine the choice of the health behavior, that is, which activities will be attempted and which ones will be avoided.[18] Self-efficacy is one's own ability to cope with stressful situations and implement necessary actions, especially in the time of labor, and cope with the pain of childbirth.[20]Thus, women who have low self-efficacy may find NVD to be unattainable and experience high fear during pregnancy.[21] Lowe and Dilks and Beal expressed self-efficacy as a key mediator in fear of childbirth and a key determinant in choosing the delivery method.[22,23] Some studies have shown a relationship between self-efficacy and outcome expectation in the context of childbirth.[21] For example, an individual may be aware of a helpful behavior but lacking the confidence in own ability to perform it; in contrast, the individual may have the confidence but having doubts in reaching the outcome expectation.[24] In this regard, outcome expectation may be enough to explain the behavior.[19]

In view of the recommendation of WHO that the caesarean sections rate must be limited to the 10-15% of all delivery cases and considering the scientific evidence that represent high rate of CS in a number of developing countries,[25] this study was scheduled to envisage relation of self-efficacy, outcome expectation and the BIM's constructs with women's intentions to select NVD method.

Materials and Methods

Participants and procedures

The study was cross-sectional and descriptive in nature, which took place from January to May 2014. The non-probability sample consisted of all pregnant women 138 of them were primiparous and 62 were multiparous recruited from five urban health care centers from among seven centers in Pars Abad City, Iran. Estimates for the number of women to be selected at each health services center were calculated in proportion to the size of the population in which each health care delivery center covered.

Due to the focus on women's tendency to NVD or CS, eligibility criteria included: (1) being

literate, (2) to be in the first 26-30 weeks of pregnancy, (3) have a normal pregnancy without any medical indication to make CS inevitable, and (4) being mentally and cognitively able to be interviewed and complete questionnaires. In addition, exclusion criteria were having twin pregnancy, history of miscarriage, history of previous CS, medical indications that suggest CS as the only choice of practice, and not having prior facilitated NVD for instance by using vacuum or forceps. The participants ranged in age from 18 to 35 years (Mean=25.19, SD=4.48). Of all-214 participants in the selected urban health center, 200 women (93.4%) completed the written questionnaire completely. A researcher-designed questionnaire was used to collect self-reported data after examining its reliability, validity and feasibility.

Ethical Considerations

Tabriz University of Medical Sciences' Ethics Committee approved the study. The women received a demonstration on how to fill in the questionnaire before participation and all study participants signed an informed consent form before completing the questionnaire.

Measures

Demographics

The demographic data included age, level of education (elementary, secondary, high school, university), employment status (housewife, employed), pregnancy (wanted, unwanted), place of delivery (public hospital, private hospital), history of smoking (yes, no), type of prenatal care (private physicians, health care center, both), medical doctor's recommendation for choosing the CS (yes, no), having health insurance (yes, no), having supplemental insurance(yes, no), and household income (low, average, high).

Knowledge of NVD Benefits

The knowledge of NVD benefits was measured, using 11-item (e.g., the risk of postoperative infection is lower in NVD). The options were yes, no, or I do not know. Each correct answer received two points, followed by one point for I do not know, and zero point for the incorrect answer. The maximum score was 22 points.

Attitude toward NVD

Measurement of attitudes toward NVD was performed by 15 items (e.g. natural vaginal delivery is easier than caesarean delivery) in the questionnaire. A 5-point Likert-type scaling from 1 which represented strong disagreement to 5 that reflected strong agreement was used. The maximum achievable score was 75; thehigherscoreindicateda stronger positiveattitude toward NVD.The estimated reliability coefficient was brought in Table 1.

Table 1: Instrument construction

Scales	# of Items	CVI*	CVR#	Reliability coefficient
Knowledge of NVD Benefits	11	0.89	0.91	0.86
Attitude toward NVD	15	0.95	0. 97	0.69
Subjective Norms of NVD	8	1.00	1.00	0.83
Outcome Expectations of NVD	12	0.94	0.97	0.93
Self-Efficacy for NVD	5	1.00	1.00	0.85
Intention to Choose NVD	2	1.00	1.00	0.90

* Content Validity Index
#Content Validity Ratio

Subjective Norms of NVD

Positive subjective norms concerning NVD refer to the role that different people may play in choosing the delivery method. An 8-item questionnaire (e.g., my mother and sister are recommending the natural vaginal delivery; therefore, I do the natural vaginal delivery) was employed, using a 5-point Likert-type scaling (1=strongly disagree to 5=strongly agree). The maximum possible scale score was 40 points; the higher score indicated the greater role of others that they may have in the individual's decision to perform a NVD.

Outcome Expectations of NVD

A 12-item questionnaire (e.g., I will have less pain after the natural vaginal delivery) was used to

measure the construct of the NVD's outcome expectations based on a 5-point Likert-type scaling (1=strongly disagree, to 5=strongly agree). The maximum possible scale score was 60 points; the higher score indicated desirable outcome expectations from NVD selection.

Self-Efficacy for NVD

To gauge the self-efficacy of NVD, a 5-item rating scale (e.g., the natural vaginal delivery is hard; but, I will do the natural vaginal delivery) was used. The possible ratings were ranged from 1 to indicate strong uncertainty to 5 representing strong confidence. The maximum possible score was 25; the higher score indicated the greater individual's self-efficacy for selection of NVD.

Intention to Choose NVD

Two-item scale was used to measure the intention to choose NVD: 1) "Which one of delivery method do you intend to choose?" and 2) "If your physician make you free to choose delivery method which one of NVD or CS you will prefer?". Two options were available for each item, namely, CS or NVD.

Statistical Analyses

Data analyses were conducted, using the SPSS-21 (Chicago, IL, USA) and MPLUS software. Descriptive statistics were used to summarize and organize the data. A series of the chi-square test of independence was performed to examine group differences with respect to categorical demographic variables. Pearson Product Moment Correlation Coefficient was computed to examine the direction and magnitude of the simple associations examined throughout the study. Structural equation modeling (SEM) was performed to test the model, using maximum likelihood estimation. The variables were entered in the binary path analysis considering their presence and their role in the conceptual model. According to this criteria intention to have NVD were entered as a binary endogenous variable and attitude toward NVD, subjective norms of NVD, Self-efficacy of NVD and outcome expectation of NVD were entered as the variables in this model. Goodness of fit Indices of χ^2 estimate with degree of freedom (df) and the root mean squared error of approximation (RMSEA) were used as the absolute fit indices of model.

Results

The participants ranged in age from 18 to 35 years (Mean=25.19, SD=4.48). The intention to choose NVD and level of education were statistically correlated. Seventy nine percent (158/200) of the women who had a high school level or greater education reported that they decided to choose NVD (Table 2). No other significant associations were found.

As expected, attitude toward NVD was positively associated with: 1) outcome expectations of NVD, 2) self-efficacy of NVD, and 3) a negative association with subjective norms of NVD. The correlation between the outcome expectations of NVD and self-efficacy of NVD was also statistically significant. The correlations between positive subjective norms of NVD and 1) outcome expectations of NVD and 2) self-efficacy of NVD were not statistically significant.

The highest correlation was observed between the positive attitude toward NVD and self-efficacy of NVD (Table 3), respectively. The final model fit the data well, χ^2= 6.04, df= 2, *P*=0.04, Tucker-Lewis index (TLI) =0.87, comparative Fit index (CFI) =0.97, RMSEA=0.10 (CI: 0.01, 0.20); χ^2/df (3.02) was statistically significant. Additionally, a positive attitude toward NVD was directly correlated with the self-efficacy for NVD(β= 0.36, *P*<0.001) and the intention to choose NVD (β=0.03, *P*<0.001); however, it was not correlated with the subjective norms of NVD. The study hypothesis provided the basis to define the model (Figure 1), and SEM, using the Mplus software was used to test it.

Table 2: Characteristics of Participants (n=200)

Variables		n (%)	Intention to choose NVD		
			χ^2	Df	Sig*
Educational level	Elementary	20 (10.0)	10.97	3	0.012
	Secondary	22 (11.0)			
	High school	114 (57.0)			
	University	44 (22.0)			
Employment status	Housewife	188 (94.0)	0.95	1	0.328
	Employed	12 (6.0)			
Pregnancy	Wanted	174 (87.0)	0.56	1	0.453
	Unwanted	26 (13.0)			
History of smoking	Yes	0 (0.0)	#		
	No	200 (100.0)			
Type of prenatal care	Private physicians	3 (1.5)	2.71	2	0.376
	Health care center	116 (58.0)			
	Both	81 (40.5)			
CS recommendation by MD	Yes	5 (2.5)	0.10	1	1.000
	No	95 (97.5)			
Place of delivery	Private hospital	2 (1.0)	0.00	1	1.000
	public hospital	198 (99.0)			
Having health insurance	Yes	116 (58.0)	0.50	1	0.477
	No	84 (42.0)			
Having supplemental insurance	Yes	33 (16.5)	2.96	1	0.085
	No	167 (83.5)			
Household income	Low	75 (37.5)	1.98	2	0.370
	average	124 (62.0)			
	high	1 (0.5)			

No statistics are computed because history of smoking is a constant./**P*-value based on chi-square test.

Table 3: Correlations between Behavioral Intention Model's variables, outcome expectation, and self-efficacy (n=200)

Variables	1	2	3	4
1.Positive Attitude toward NVD	-			
2.Outcome Expectations of NVD	0.320**	-		
3. Positive Subjective Norms of NVD	-0.158*	-0.027	-	
4. Self-Efficacy for NVD	0.510**	0.301**	-0.102	-

*P< 0.05, **P< 0.01.

In addition, the outcome expectations for NVD and self-efficacy of NVD had direct relations to the intention to choose NVD, β= 0.02, P<0.001 and β= 0.06, P<0.001(Table 4). An examination of the constructs showed direct paths from the outcome expectations of NVD to the attitude toward NVD (β=0.25, P<0.001) and the self-efficacy for NVD (β=0.24, P<0.05).

The variable of the subjective norms of NVD was not directly correlated with the self-efficacy for NVD and the intention to choose NVD. The model explained 25%, 8%, and 9% of the variance in the self-efficacy for NVD, outcome expectations of NVD, and attitude toward NVD, respectively.

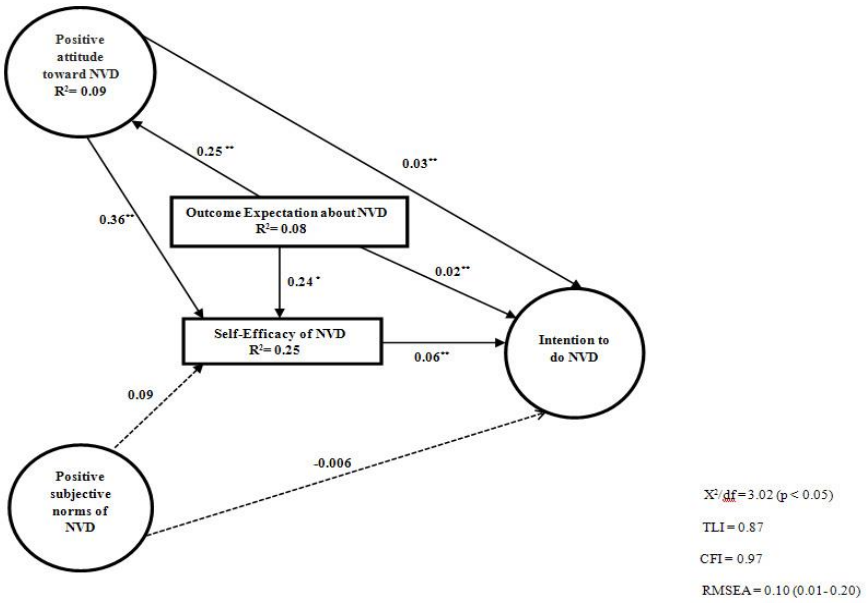

Figure 1: Structural Equation Model for the Intention to Choose the NVD

Coefficients of determination (R^2 values) for the interpretation of the categorical outcome measures are not the same as the one appropriate for continuous measures,[26] thus, in this model, the intention to choose NVD cannot be explained by the coefficient of determination.

Table 4: Comparing the means scores of Knowledge, Attitude, Subjective Norms, Outcome Expectations, and Self-Efficacy among Primiparous & Multipara cases

Variables	Primiparous (N=138)	Multipara (N= 62)	t	df	*P*-value[#]
	Mean ± SD	Mean ± SD			
Knowledge of NVD Benefits	16.90 ± 3.43	18.50 ± 3.53	-3.02	198	0.003*[a]
Attitude toward NVD	49.25 ± 9.40	52.63 ± 9.80	-2.32	198	0.021*[a]
Subjective Norms of NVD	49.81 ± 8.90	55.29 ± 6.85	-4.74	150.10	< 0.001**[b]
Outcome Expectations of NVD	21.02 ± 8.27	19.41 ± 10.22	1.08	98.33	0.279*[b]
Self-Efficacy for NVD	12.00 ± 7.19	17.02 ± 7.07	-4.58	198	< 0.001**[a]

*P< 0.05, **P< 0.01.

#*P*-value based on Independent Samples T-Test.

[a]*P*-value based on Equal variances assumed and is reported Sig. (2-tailed).

[b]*P*-value based on Equal variances not assumed and is reported Sig. (2-tailed).

Discussion

The primary purpose of the study was to examine the usefulness of the self-efficacy and outcome expectations of NVD, which were both derived from Bandura's Social Cognitive Theory, as well as from the BIM's constructs in explaining women's intention to choose NVD. Both variables, as well as the attitude toward NVD, were statistically significant in explaining the outcome measure. Additionally, the three variables were correlated with each other.

The study revealed that the self-efficacy for NVD was related to the intention to choose NVD. Other studies have reported that self-efficacy may play a role in behavioral intentions.[20,27-29]Salomonsson et al. suggested that self-efficacy had an important role NVD, which could enable a person

to cope with labor and childbirth.24 Explicitly, women who fear childbirth may choose a CS to avoid the pain associated with NVD,[24,30-33] which is likely driven by low confidence in NVD.[34]Khorsandi et al. reported that self-efficacy has an important and determinant role in the choice of delivery method.21 Our review of the literature found other similar findings as well.[17,21, 24,34-36]

Self-efficacy differs from outcome expectations.[21,37] In our study, we found that: 1) the outcome expectations for NVD and self-efficacy were directly correlated with the intention to choose NVD, and 2) self-efficacy for NVD did not mediate the relationship between the outcome expectations for NVD and the intention to choose NVD. Outcome expectations were related to intention and was important in the formation of intention, as positive outcome expectations can be instrumental in changing one's behavior.[38,39] However, Iannotti et al. and Tudoran et al. found an interaction between outcome expectations and self-efficacy in individuals' intention. This means that individuals believed that they could perform a certain health behavior,[38,40] but they did not because they questioned consequences of performance of such behavior.[41] Hence, these findings implied a relationship between the outcome expectations and self-efficacy.[39,42] and also illuminated women's decision-making for delivery method,[21,37] which were consistent with our findings. If self-efficacy is specified as a mediator between outcome expectations and intention, the direct relation of outcome expectations to intention may dissipate. Thus, the outcome expectations may be related to intention in two different ways: 1) directly (in promotion outcome expectations- intention) or 2) by influencing self-efficacy that may subsequently influence intention (in prevention outcome expectations intention).[38]Thesecond way was not supported by our study findings.

Pregnant women who had largely favorable anticipated outcome expectations of NVD showed positive attitudes toward NVD. In other words, their expectations of NVD outcomes were positively related to their beliefs and expected values associated with NVD. In addition, their positive attitude toward NVD was directly related to their ability to perform vaginal birth, which was related to self-efficacy. However, these three concepts were independently related to intention of choose NVD. A person's beliefs about a certain behavior, outcome expectations, and values are associated with attitudes; that is, a person's attitude toward behavioral intention may be construed as a linear combination of outcome expectations and expectancies.[39,42] Thus, it may be concluded that individual's beliefs about NVD and outcome expectations are useful in identifying attitudes toward NVD.

Tanglakmankhog et al. reported no relationship between labor outcome and fear and anxiety of childbirth,[43] but reported that low fear and birth anxiety in childbirth was associated negatively with high self-efficacy for labor.[21,42,44,45] Emotional status and socialized attitudes toward childbirth can affect parturient women's childbirth self-efficacy[21,34] while negative beliefs about, and low self-efficacy in vaginal birth have been related to a preference for the CS.[34] These findings are consistent with our results. Additionally, our findings were similar to previous studies in Iran which showed that positive attitudes of pregnant women were directly correlated with the intention to choose NVD.[10,36] In spite of the findings that suggest a relation between the subjective norms and the intention to choose NVD,[10, 31, 36, 42, 46,47] our findings did not support such an association. Moreover, it is possible that factors such as fear of childbirth, fear of caregiver's bad behavior during childbirth, concern about the pain of childbirth, and having a healthy baby can overcome the impact of the subjective norms on the intention to choose NVD. Thus, it seemed that our study participants preferred NVD irrespective of social demands.

Because past achievements and previous positive experiences reinforce self-efficacy, confidence in one's ability to cope with labor is higher among multiparous women than those who are pregnant for the first time; hence, self-efficacy is an important correlate of a positive experience.[17, 21,43]

Despite the emphasizes on performing CS in only medically complicated cases, the main reasons leading to a high tendency and preference for

CS among Iranian pregnant women are non-medical reasons and beliefs as well as several social, cultural, and economic factors irrespective of medical indications.[36] Therefore, request for CS among Iranian pregnant women seems to be multi-factorial, and non-medical reasons, such as fear of labor pain, previous undesirable experience, pelvic and vaginal damages, false beliefs about the effects NVD may have on body shape and appearance, fear of caregiver's wrong manipulation during labor, and following of the prevalent norms among women[36,48] are the major precipitating ones. Additionally, more requests for CS in Iran might be because of social norms between families who are classified as medium to upper socio-economic class.

Our findings suggest that attitudes toward NVD are the main variable associated with NVD, alongside self-efficacy and outcome expectations, which relate to intention to choose NVD. Our findings could have been influenced by the fact that the majority of the participants were nulliparous or women who had never given birth to a viable child; thus, they did not have childbirth experience, which in conjunction with emotional state and stress level could have affected their self-efficacy.

Limitations

The study limitations must be acknowledged. First, self-reporting was used to collect the data, which relied heavily on the recollection of past events. Thus, recall bias cannot be ruled out. Second, the results cannot be generalized to all Iranian women and other populations because of small sample size and including a sample only from Pars Abad, Iran. Furthermore, lack of use of standardized data collection instruments was a limitation because the researchers applied a researcher-designed scales for identifying socio-demographic and health variables, rather than using previously standardized instruments, which may have resulted in lack of comparability with other studies, inaccuracies, and misclassification and also unpleasant experiences during previous vaginal delivery were not measured while, they might have direct effect on the women's willingness to request elective CS. Additionally, due to the non-probability nature of sampling, external validity was limited to the study's participants. Finally, due to non-experimental and cross-sectional design of the study, no causal inferences can be drawn.

Conclusion

Based on the study's results, it can be concluded that the self-efficacy and outcome expectation, as the main constructs of Bandura's Social Cognitive Theory, are necessary and key factors related to intention to choose vaginal birth along with BIM's constructs especially attitude toward NVD. Thus, it is recommended to consider them in explaining women tendency toward NVD or CS. In addition, improving women's NVD self-efficacy together with highlighting benefits of NVD through designing educational interventions might be an effective approach in changing women's intentions toward NVD as well as improving childbirth programs. Additionally, we recommend a systematic replication of the study by adding demographic characteristics, which in addition to self-efficacy and outcome expectations, can affect the choosing of the delivery methods. It will be informative however; to do further investigations about the role labor self-efficacy may play in the tendency of women to choose NVD in populations with high rates of CS.

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Competing interests

The authors report no conflicts of interest.

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