Application of Health Belief Model Forpredicting Delivery Method among Pregnant Women Ofsemirom: A Cross-Sectional Research

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Abstract: Introduction: Nowadays cesarean rate in Iran has been exceeding from recommended rate by World Health Organization (WHO). Prior to any intervention in this regard, determinant and influent factors should be surveyed. This study has been carried out to predict the delivery method in pregnant women ofSemirom city using health belief model constructs in 2011. *Materials and Methods:* In this cross-sectional research, 104 pregnant Nulliparwomen in 3^{rd}trimester of pregnancy with successive visits to urban health centers of Semirom were investigated with census report method. Data were obtained by valid and reliable health belief model constructs-based questionnaire and analyzed by SPSS16. Women participation in this study was voluntarily and with informed consent. *Results:* The studied pregnant women average age was 24.6±3.8 and the mean marriage age for them was 21.9±3.3. Literacy levels of most individualswere graduate degrees (31.7%) and high school diploma (30.8%). 84.6% were housewives and majority of them (60.6%) declared their economic situation as medium. Among studied pregnant women 28.8% and54.8% had chosen to have cesarean delivery and normal vaginal one respectively and 16.3% had no preference in investigation time. Finally after a telephone follow-up to inquire delivery method it was found out that 71.15% was performed by natural delivery (normal vaginal delivery) and 28.84 had cesarean method. In assessing selected delivery method predictors using logistic regression among health belief model structures, perceived self-efficacy (P<0.05, OR=1.22) and perceived benefits (P<0.05, OR=0.87) significantly were determinant in performed delivery method (P<0.05, R=0.58). *Conclusion:* Given the perceived self-efficacy and perceived benefits roles in delivery method prediction, it is recommended to consider these structures in designing educational interventions in order to promote safe delivery in research area.

Key words: Cesarean · Natural Delivery · Health Belief Model

INTRODUCTION

Delivery is one of the most important issues for human being and generation on the world. Process through which childbirth naturally occurring, is called natural vaginal delivery [1], whilst cesarean is delivery of child through incisions in abdominal wall (so called Laparotomy) or uterus (Histrotomy) [1]. Condition that prevents natural delivery includes; delivery difficulty, non-reassuring pattern offetal heart rate, abnormal display, unsuccessful trial with forceps or vacuum, failure and lack of natural birth perform [1]. Investigations have shown that Iran has the higher cesarean rate than that in

European countries and this is due to contributing several factors that has made increasing effect on cesarean rate during last 4 decades. Consequently,it has led to public interest as well as service providersto choose cesarean in comparison with natural delivery so that it has been raised more than WHO accepted rate (5-15%) [2, 3]. Approximately, 18.5 million cesarean are occurring annually in the world [3]. According the latest report published by WHO in 2011, results during 2000-2011 shows that Cyprus and Chad have the highest (50.9%) and lowest (0.4%) cesarean rate respectively [4]. Based on reportfrom Iran's ministry of health, the cesarean rate is between 55 to 60 % in major cities and 44% nationwide,

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which is high ratio in comparison with global rate, 20% [5]. It should be noted that cesarean delivery has several adverse effects on both mother and infant including; uterine infection, wound complications, surgical site damage, cerebral complications and fetal death [1]. Also, increased mortality in cesarean delivery is 4-5 times [6, 7]. Given the mentioned effects and the statistics, to achieve the acceptable cesarean rate desired by WHO, it is necessary to investigate the determinants of the recent increased status. One of the main reasonsfor cesarean increase is nonmedical factors and maternal request [8, 10]. There are various factors in literature that were listed as predictors of delivery method [11-25]. Some of them are; psychological factors such as partner, family and friendsperceived support in delivery decision, perceived self-efficacy, high value expectations [11], behavioral intention of pregnant women and their partners [12], perceived risk of vaginal delivery, perceived risk of cesarean delivery for infants and subsequent pregnancies, susceptibility [13-15], perceived benefits of various methods of birth [15-16], physician's persuasion for vaginal delivery [16], perceived recommendations from physician [17-18], un-awareness on cesarean effects [19], natural delivery fear [17-19] and also socio-demographic features of pregnant women [20-24]. Although several studies have been done on factors influencing choice of delivery method, there was no report on predictability of health behavior theories and models in health educationon this aspect. Since factors mentioned above arethe main structures of health belief model (HBM), researchers of present study intent to test application of HBM for predicting delivery method selection among pregnant women. Health belief model explore the relationship between belief and behavior. Based on this model, the main predictors of behavior are; perceived susceptibility (one's belief on his vulnerability to disease), perceived severity (one's belief on consequences of disease), perceived barriers (one's belief on obstacles against performing of health behavior), perceived benefits (one's belief on advantages of health behavior) and perceived self-efficacy (one's belief on own ability to successfullycarry out health behavior) [26-27]. As determining factors associated with health behaviour such as selection of safe delivery within the health belief model can be used in design effective educational interventions, so the current study has been conducted to determine predictability of health belief model constructs in delivery method selection among pregnant women.

MATERIALS AND METHODS

The study was a cross-sectional research carried out in October 2011 among pregnant women with successive attends to urban Semirom city health centers for prenatal cares. Beingnulliparous as well as located in the third trimester of pregnancyand consent to participate in the studywere inclusion criteria. Census sampling was used as there was no remarkable distribution and the population was restricted. Totally, the data collected from 104 pregnant women referring to the Semirom city health centers. The data was collected with health belief model-based questionnaire (including; perceived susceptibility, perceived severity, perceived barriers, perceived benefits and perceived self-efficacy). Reliability and validity of questionnaire was confirmed in preliminary studies [28]. To assess awareness, there were 15 questions in designed tool. Other structures were measured with a Likert type 5-choice scale. Each constructs of perceived susceptibility and severity were measured by 6 questions with score range of 6-30. Perceived barriers were measured by 10 questions with score range of 10-50 and also, perceived benefits were measured with the same method as well. Finally self-efficacy was measured by 4 questions with scorerange of 4-20. After completion of questionnaireswith pregnant women, the obtained data was analyzed using statistical software of SPSS16 (descriptive statistics, Chi-square tests and logistic regression and correlation analysis). Well written and informed consent of the mothers participating in the study was obtained as well. To track final delivery method,the mothers were called by phoneafter 3 months.

RESULTS

Findings showed that the mean age of pregnant women was 24.6±3.8. This was 21.9±3.3 for marriage age. Majority of mothers had graduate (31.7%) and high school (30.8%) studies. 84.6% of individuals were housewives and majority of them declared their economic situation as average. Amongst studied pregnant women 28.8% and 54.8% had decided to perform cesarean and to have natural delivery respectively and 16.3% of them had no preference. After telephone follow up, we found that 71.15% have done natural delivery and 28.84% have selected cesarean. Individuals of both groups had significantly difference in age and behavioral intention but there was no significant difference in socio-demographic features of two mentioned groups.

Table 1: Comparison of knowledge andhealth belief model structures between cesarean and NVD groups

	NVD Group (M±SD)	Cesarean Group (M±SD)	Total (M±SD)	P.value
Knowledge	3.6±6.6	3.2±6.1	3.5±6.5	N.S
Perceived susceptibility	3.8±20.2	3.4±18.6	4±19.7	N.S
Perceived severity	3.2±19.6	2.3±18.8	3.2±19.3	N.S
Perceived barriers	8.1±23.5	6.3±29	8±25.1	0.001
Perceived benefits	6.8±36.9	6.2±35.7	6.6±36.6	N.S
Perceived self-efficacy	4.2±13.7	4±10.8	4.3±12.9	0.002

Table 2: Correlation among health belief model constructs and behavior

	Perceived susceptibility	Perceived severity	Perceived barriers	Perceived benefits	Perceived self-efficacy	Behavior
Perceived susceptibility						
Perceived severity	0.54*					
Perceived barriers	- 0.5*	-0.28*				
Perceived benefits	0.5*	0.59*	-0.59*			
Perceived self-efficacy	0.4*	0.46*	-0.68*	0.72*		
Behavior	0.18	0.1	-0.3*	0.08	0.29*	0.38*

* Significance level of P.value<0.001

Table 3: logistic regression for correlates of delivery method using health belief model constructs

	B	P-value	OR	95% CI for OR
Constant (a)	3.25	0.2	26	
Perceived susceptibility	0.057	0.4	1.05	1.2, 0.9
Perceived severity	0.051	0.6	1.05	1.13, 0.85
Perceived barriers	-0.071	0.1	0.931	1.02, 0.85
Perceived benefits	-0.139	0.02	0.87	0.98, 0.77
Perceived self-efficacy	0.2	0.03	1.22	1.47, 1.01

Comparison of knowledge score and health belief model structures between cesarean and natural delivery groups have presented in table 1. Given the obtained results there is significant difference in perceived barriers (P=0.001) and perceived self-efficacy (P=0.002) of the two groups.

To determine the predictive ability of health belief model constructs for delivery method, logistic regression analysis was carried out. Correlation among health belief model constructs and findings oflogistic regression have presented in tables 2 and 3. As shown, perceived self-efficacy and perceived benefits are crucial in prediction of final delivery method (P<0.05 and R= 0.58). This correlation can be summarized as below:

$$\frac{probability\ of\ natural\ delivery\ selection}{probability\ of\ cesarean\ selection} = 3.25 + 0.2$$
$$(percevied\ self-efficacy) - 0.139\ (Perceived\ benefits)$$

As this model shows, there is direct relationship between increase in perceived self-efficacy and natural delivery performance, therefore with enhance in perceived self-efficacy, the likelihood of natural delivery increase rather than cesarean, but increasing perceived benefits do not necessarily increase the natural delivery compared with cesarean.

DISCUSSION AND CONCLUSION

As the results showed 71.15% of studied women had natural delivery and 28.8% delivered with cesarean. In cross-sectional study by Negahban *et al.* in Rajsanjan city of Iran, 31.21% and 68.75% of women had cesarean and natural delivery respectively [19]. In contrast, a survey by Chong and colleagues on pregnant mothers in Singapore showed that 3.7% of women selected cesarean and 96.3 choose natural delivery [29]. In another research on delivery preference of pregnant women by Graham and co-workers in Scotland, 7% of women selected cesarean and the remained (93%) preferred normal vaginal delivery [30]. The higher cesarean rate in present study compared withSingapore and Scotlandmay be the result of difference in available prenatal cares and health system performance, physicians' attitudes and socio-cultural conditions among countries. As mentioned in results of present research, perceived self-efficacy and perceived benefits are crucial in prediction of final delivery method.In study conducted by Smart on attitude andprediction of delivery preference amongnulliparous and multiparous women, those with higher self-efficacy had higher intentions for natural delivery [11]. Khorsandi and *et al.*. investigated pregnant women self-efficacy and confirmed the role of self-efficacy as a key determinant in choosing birth method and delivery fear control [31]. Women's self-efficacy could be

increased through learning experiences focused on their control and ability perceptions to over the pain relief and comfort cesarean conformation [11]. About perceived benefits effect, findings of Ridley *et al..* research on women with cesarean experience showed that perceived benefits from natural delivery after a previous cesarean is an effective factor [16]. Also, studies of Fenwick *et al.* onbeliefs for selection of cesarean delivery after previous cesarean experience, Fardi Azar *et al.* about determinants of delivery method and Mohammadpour and co-workers on factors influencing delivery method revealed thatfor delivery method selection, women consider benefits of each method [15, 18, 32]. In this study we found that perceived benefits has reverse correlates with behavior. Indeed, increased perceived benefits from natural delivery is not necessarily led to higher likelihood of natural delivery preference. Results also showed that in cesarean group despite of high awareness on the benefits of natural delivery still this knowledgeis not incentive to select natural childbirth. Maybe one reason for this reverse relationship in delivery method prediction is that determination of model structurespredictability is independent from modifying factors (socio-demographic features), thus it affect the correlation. Of other health belief model structures (perceived susceptibility, perceived severity and perceived barriers) had no significant effect on behaviour prediction. Different result on obtained in Disney study on decisions of pregnant women with a previous cesarean experience as he found that perceived risk and susceptibilityfrom each of delivery methods are influent in preferred delivery method [14]. Fuglen and colleagues study on Gynecologists selection for cesarean section without medical reason, confirms this result [33]. Also, Negahban *et al.* concluded that perceived barriers are effective in delivery method so that the leading cause of cesarean preference by pregnant mothers is barriers such as fear from natural delivery. In addition, high adverse effects of cesarean had been reported as a reason for natural delivery preference [19]. Lack of predictive abilityfor these structures may be result of being nulliporus, sampling method and homogeneity of individuals in terms of mentioned structures and socio-demographic features. In general, perceived self-efficacy and perceived benefits were predictors of behavior (delivery method) in this research. Therefore, these structures can help in designing educational interventions aimedcesareanreduction. As self-efficacy is effective in prediction of natural delivery or cesarean, hence what should be considered in educational interventions to increase safe delivery is improving skills and abilities of pregnant women for natural childbirth. One of the limitations of present study was restriction in studied population and lack of diversity. So it is recommended to do such study on pregnant women inbroader and more diverse scale.

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