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Predictors of Exclusive Breastfeeding among Nulliparous Iranian Mothers: Application of the Theory of Planned Behavior

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Abstract

Background

Although exclusive breastfeeding (EBF) is highly emphasized by the experts, nulliparous women do not adhere to this behavior at a desirable level. Since it seems that mothers' beliefs and values play an important role in their adherence to these behaviors, the present study, aimed to perform a careful analysis of the behavior and evaluation of factors associated with the EBF in nulliparous women referring to healthcare centers in Bushehr using theory of planned behavior.

Materials and Methods

This is a cross-sectional study, which was conducted on 400 nulliparous mothers with children less than six-months who referred to healthcare centers in Bushehr, Iran. Stratified random-sample was used and data were collected using a researcher-made questionnaire and were later analyzed using statistical tests, including Pearson, Spearman, linear regression and logistic regression in SPSS version 22.0 Software.

Results

The results showed that 62.5% of infants were exclusively breast-fed. Variables such as infant' gender, father's occupation and type of pregnancy were significantly related with EBF behavior. Constructs, including attitude (P< 0. 001, r=0.295), subjective norms (P< 0. 001, r=0.376) and perceived behavioral control (P< 0. 001, r=514) were significantly correlated with the EBF intention. Subjective norms, perceived behavioral control and behavioral intention predicted 13.8% changes in mothers' breastfeeding behavior.

Conclusion

The theory of planned behavior is an appropriate framework to identify factors associated with the EBF behavior among nulliparous Iranian mothers. Therefore, designing interventions based on this theory seems to have the potential to improve the EBF practice.

Keywords: Exclusive Breast Feeding, Theory of Planned Behavior, Nulliparous women.

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1- INTRODUCTION

Breastfeeding is one of the most important strategies for improving children's health status in different societies. Breast milk is the best food and nutrition for optimal growth and development of children and will have a significant emotional and mental effects on the children's health (1, 2). Indeed, breastfeeding from birth to six-month and continuing breastfeeding with complementary foods until the end of two years is the best feeding method and has beneficial health effects on mother and baby (3). The World Health Organization (WHO) has put special emphasis on the exclusive breast feeding until the end of 6 months. According to the WHO exclusive breast feeding refers to breastfeeding without adding any food except water and juice, allowed vitamins and minerals (4). Breastfeeding protects babies against many diseases. Cholesterol in human breast milk contains large amounts of antibodies and nutrients that protect babies against many diseases including infectious diseases such as diarrhea, pneumonia and allergic disorders such as asthma and eczema. Studies have shown that breastfeeding within the first hour of birth, decreases the infant mortality rate by 19% to 22% (1, 5, 6).

Breastfeeding not only protects children against many diseases and plays an important role in improving their health status, but also plays a key role in maternal health so that breast-feeding can protect mothers against breast and ovarian cancer, osteoporosis and postpartum bleeding (7). On the other hand, the positive physical, psychological and economic effects of breastfeeding can also be effective in reducing costs in the health care system. The available evidence shows that breast-feeding advantages and benefits have the potential to reduce health care costs in the United States of America by 6.3 billion dollars annually (8).

Although Exclusive Breast Feeding (EBF) can have significant effects on children's health and is also seriously recommended by the International Organization to achieve optimal development, unfortunately, in most countries (both developed and developing), the EBF is less practiced up to six months of age (9).

Breast-feeding pattern is different in different communities and its rate is generally between 1% and 90% worldwide (10). Exclusive-breast feeding rates of 20% and 44% in infants less than 6 months old were reported in the countries of Central and Eastern Europe and South Asia (9). Although, 70% of American mothers start breastfeeding after delivery, about 42% breastfeed their infants up to six weeks and only 32% of them continue breastfeeding until six months of age (11).

According to the report presented in 2000 and 2006, only 28% of mothers in Pakistan, 16% in Iraq, 25% in Saudi Arabia and 38% in Egypt have been have practiced EBF (12). While according to Demographic Health Survey (DHS) (2000) and Integrated Monitoring Evaluation System Survey (IMESS) (2004) in Iran, exclusive breast feeding up to 6th month has been reported 44% and 27%, respectively (10). The results of the study conducted by Olang et al. also showed that 56% and only 28% of Iranian babies were breastfed up to 4 and 6 months of age, respectively (13). The results of the only study that was conducted in 2001 in Bushehr also showed that despite the fact that 96% of mothers have practiced breastfeeding from birth, the EBF has been reported only in 47% of cases (14). In fact, according to past studies, even if the EBF begins at birth, continued breastfeeding, especially EBF is ignored in many cases.

Therefore, it is necessary to achieve a better understanding of behavioral patterns and factors affecting the breastfeeding behavior of mothers in order to adopt proper strategies to promote this behavior.

Previous studies investigated the relationship between demographic, physical, mental and social variables and the initiation and continuation of breastfeeding in mothers (15). For example, in European countries, younger mothers and mothers who had less education practiced the breastfeeding behavior less than other mothers. Planned pregnancies, maternal education level, birth weight and sex have been reported as other factors affecting breastfeeding behavior of mothers (16). Postpartum anxiety and depression are also significantly effective in reducing breastfeeding behavior of Australia's mothers (17). Most studies on factors affecting the breastfeeding behavior of mothers have been done in high-income or developed countries. Thus, using the findings from these studies in lower-income and less developed countries does not seem very practical. In addition to the above factors, different studies have emphasized the role of mothers' beliefs in adhering to the breastfeeding behavior.

For example, a study showed that some maternal beliefs such as self-efficacy and intention have been effective in promoting the breastfeeding in America (15). Other studies have emphasized the opinions of others and cultural norms as well as resources to support the mother's decision-making process regarding practice of the breastfeeding behavior (18, 19). Undesirable attitudes are one of the most important factors affecting mother's intention to breastfeed their children in America (20). Considering that various studies showed that different factors could be associated with the breastfeeding behavior of mothers and whereas behavioral theories can be helpful in understanding this behavior, so, after considering the key role of mothers' beliefs along with other variables, it seems that the Theory of Planned Behavior (TPB) and its constructs can provide proper information for understanding this behavior. TPB is one of the most well-known theories for understanding the behavior by considering the role of one's beliefs. Moreover, some direct experiences are self-originated and others are obtained through information and direct experiences of others. In this theory, the behavioral intention is the most important structural determinants of behavior, which is affected by three independent constructs, including attitude, subjective norm, and perceived behavioral control. One's attitude toward behavior is a reflection of the resultant positive or negative evaluation towards adopting that behavior (21).

Subjective norms are also affected by a person's beliefs about the expectations of others and his/her motivation to fulfill these expectations. So, these norms often serve a useful means to understand social pressures to decide to do or not to do the behavior. Normative beliefs are defined in the form of confirmation or rejection of the intended behavior by other individuals who are deemed important from the person's perspective. One's motivation to follow the will of others and accept others' expectations is known as motivation to meet others' expectations. Perceived behavioral control also refers to the degree of how one feels about the fact that to what extent doing or not doing the behavior is under his/her voluntary control, which may directly and indirectly affect the behavior through intention. This construct is affected by one's belief about how easy or difficult the behavior is and often originates from real control (21).

Considering the critical role of breastfeeding in the evolution of infants and also identification of the major factors affecting the breastfeeding behavior, which can achieve applied scientific findings to change and modify this behavior by applying the principles of theoretical principles and guide breastfeeding promotion programs in any

society; therefore the present study aimed to determine the most important factors affecting the breastfeeding behavior of mothers with children less than six months who referred to healthcare centers in Bushehr, Iran by using the theory of planned behavior. The results of the present study can help, by identifying important factors affecting the breastfeeding behavior of mothers, design appropriate educational interventions and strategies to promote EBF and the prevention of early cessation of EBF.

2- MATERIALS AND METHODS

2-1. Study design and population

The present research was a cross-sectional study, which was conducted on 400 nulliparous women referring health centers in Bushehr city, South West of Iran.

2-2. Methods

In this study the stratified random sampling was done in all Healthcare centers (11 centers) in Bushehr. In the implementation phase, subjects were randomly selected in proportion to the number of mothers with records registered in each center. The researcher attended to healthcare centers within May and June 2016, and research questionnaires were completed by mothers after obtaining their informed consent letter.

2-3. Measuring tools: validity and reliability

Data collection tool included a researcher-made questionnaire and consisted of three parts. The **first part** consists of 8 questions related to demographic characteristics (age, family size, spouses' job, type of delivery, infant sex, spouses' level of education, type of pregnancy and household income). The **second part** related to the theory of planned behavior constructs. The following questions were considered in this part:

Four attitude questions with 3 to 9 Semantic Differential (SD) 5 pointed measures mother's reactions to stimulus words and concepts in terms of ratings on bipolar scales defined with contrasting adjectives at each end such as "Feeding my child with my milk is pleasant/ unpleasant", 12 questions to measure subjective norms with answers in Likert five-option from strongly disagree to strongly agree, such as "Most people who are important to me, want me to feed my baby with my milk". Five questions were related to perceived behavioral control with answers in Likert five-option from strongly disagree to strongly agree such as "If I want, I can feed my baby with my milk". Five questions on the behavioral intention and answers about the intention with answers in Likert five-option from strongly disagree to strongly agree such as "I'm going to breastfeed my baby to the end six months". The **third part** included question on breastfeeding behavior assessment that was developed based on the definition of EBF.

Content validity was assessed using two methods: qualitative and quantitative. In the qualitative method, the prepared instrument was given to 14 health education and health promotion experts after performing library research, searching valid scientific resources and other questionnaires approved in this field; and they were asked to investigate questionnaires according to criteria, including compliance with grammar, use of appropriate terms, necessity of placing phrases in the right place, good scoring and provide the necessary feedback. The questionnaire was modified based on the feedback and comments provided by experts and their coordination.

In the quantitative analysis content validity, two indices, including content validity ratio (CVR) and content validity index (CVI) were calculated. To determine the content validity ratio (CVR), experts

participating in the previous step (n = 14) were asked to judge any question relating to the content, from which was derived in three forms, including necessary, useful or unnecessary. CVR values calculated for questions were higher than 0.51, which was acceptable according to Lawshe table. Content validity index (CVI), which represents the judgment of the validity or enforceability of the final questionnaire, was calculated values above 0.79% were obtained for the relevant questions.

Reliability of the questionnaire was also determined using internal consistency and by calculating Cronbach's alpha coefficient. In this regard, the instrument was completed by 30 mothers of children less than six months who were not entered in the final study. The alpha value was acceptable in all parts (above 0.7) and was calculated 0.76, 0.725, 0.77 and 0.755, respectively for the attitude, subjective norms, perceived behavioral control, behavioral intention domains.

2-4. Ethical consideration

The present study was approved by the research ethics committee of Bushehr University of Medical Sciences study under the Code of Ethics of IR.BPUMS.REC.2016.18. All of the study participants were informed about the purpose of the study and oral consent was obtained before interview. The information provided by each respondent was kept confidential.

2-5. Inclusion and exclusion criteria

Inclusion criteria included nulliparous mothers, having children less than six months, willingness to participate in the study, lack of a specific disease (kidney, heart, liver, mania and severe burns of both breasts that lead to disability and impaired lactation diagnosed or confirmed by the physician), lack of taking lactation suppression medications. Exclusion criteria included incomplete questionnaires.

2-6. Data Analyses

The collected data was entered using SPSS Windows version 22.0 for analysis. Descriptive statistics and logistic regression analysis was carried out to describe the variables and to determine their relationship with the outcome variable. Odds ratio (OR) with 95 % confidence interval (CI) at $P < 0.05$ was used to determine the significance level of association between predictors and outcome variable.

Also, Chi-square test was carried out to determine variables relationship with the behavior (EBF), Spearman correlation test was carried out to correlation between constructs theory of planned behavior, linear regression analysis is carried out to predict intention and logistic regression analysis is carried out to predict EBF behavior.

3- RESULTS

Overall, 400 nulliparous mothers with children less than 6 months were studied. The average age of mothers was 26.56± 5.16 years. Minimum and maximum age included 17 and 40 years, respectively. A total of 23% and more than half (51.8%) of mothers were employed and had a college education, respectively. A total of 52% and 80.8% of mothers had Cesarean delivery and planned pregnancy, respectively. Most of participants were mothers of 4 months old babies. A total of 62.5% of mothers participating in the study practiced the exclusive breast-feeding.

There was a significant relationship between exclusive breastfeeding and infant sex and type of pregnancy (**Table.1**). This means that the rate of exclusive breastfeeding was higher in mothers who have daughters and mothers whose pregnancy was wanted. The results of Spearman correlation test showed that there was a significant positive relationship between exclusive

breastfeeding behaviors and constructs of attitudes, subjective norms, perceived behavioral control and behavioral intention. Also, all structural variables of the theory of planned behavior were correlated (**Table.2**).

Among the theory of planned behavior constructs, there was highest correlation between perceived behavioral control and intention to exclusive breastfeeding (P<0.001 and r=0.514%); and then Subjective norm was highly correlated with the intention to exclusive breastfeeding behavior (P<0.001 and r=0.376%).

Linear regression analysis was used to evaluate the predictive value of the theory of planned behavior constructs. Among the construct, perceived behavioral control (B = 0.636) was the strongest predictor of mothers' intention (**Table.3**). The results of logistic regression test showed that theory of planned behavior constructs also predicted 13.8% of changes in mothers' breastfeeding behavior. Among the constructs of this theory, behavioral intention (P<0.00, B= 0.223%), and perceived behavioral control (P<0.00, B=0.191%) had the highest impact on the exclusive breast-feeding behavior (**Table.4**).

Table-1: Comparing the demographic characteristics between mothers who practiced breastfeeding and those who didn't practice exclusive breastfeeding

Variables		With exclusive breastfeeding	Without exclusive breastfeeding	P-value
		N (%)	N (%)	
Type of pregnancy	Wanted	176 (54.5)	28 (36.4)	0.003
	Unwanted	147 (45.5)	49 (63.6)	
Type of delivery	Vaginal delivery	103 (53.6)	89 (46.4)	0.3
	Caesarean section	101 (48.6)	107 (51.4)	
Infant age	Less than two months	14 (58.3)	10 (41.7)	0.562
	Two months	93 (49.7)	94 (50.3)	
	Four months	89 (47.1)	100 (52.9)	
Infant gender	Boy	87 (45.1)	106 (54.9)	0.02
	Girl	117 (56.5)	90 (43.5)	
Mother's job	Housewife	160 (51.9)	148 (48.1)	0.283
	Employed	44 (47.8)	48 (52.2)	
Level of education	Illiterate	4 (100)	0 (0)	0.8
	Primary school	7 (36.6)	4 (36.4)	
	middle or high school	94 (53.9)	84 (46.1)	
	College education	97 (46.9)	110 (53.1)	

Table-2: Matrix of correlation between constructs theory of planned behavior and the exclusive breastfeeding behavior in nulliparous mothers with children less than six months in Bushehr

Variables	Attitude	Subjective norm	Behavioral control	Behavioral intention
Attitude	1			
Subjective norm	*0.391	1		
Behavioral control	*0.464	*0.437	1	
Behavioral intention	*0.295	*0.376	*0.514	1

*P<0.01.

Table-3: Linear regression analysis of effects of TPB constructs on intention to exclusive breastfeeding

Variables	B	SE	P-value	Likelihood Ratio Chi-Square
Attitude	0.040	0.0187	0.033	200.935
Subjective Norms	0.040	0.0257	0.118	
Perceived Behavioral Control	0.636	0.0526	000	

SE: Std. Error of the Estimate; B: Slope of a line (power).

Table-4: Logistic regression analysis of effects of TPB constructs on behavior of exclusive breastfeeding

Variables	B	SE	P-value	Hosmer and Lemeshow test
Attitude	-0.014	0. 014	0.306	13.8
Subjective Norms	0. 032	0. 020	0.108	
Perceived Behavioral Control	0. 191	0. 054	0.000	
Intention	0.223	0. 044	0.000	

SE: Std. Error of the Estimate; B: Slope of a line (power).

4- DISCUSSION

The present study aimed to evaluate factors associated with exclusive breastfeeding based on the theory of planned behavior. Preliminary results revealed that 51% of nulliparous women in Bushehr practiced the exclusive breastfeeding. Although the prevalence of exclusive breastfeeding in mothers Bushehr was 47% according to a study carried out in 2004, and the was showed a few percent increase in the present study, and somehow represents the average proportion of exclusive breastfeeding among babies in Bushehr, it is important to consider the fact that nearly half of babies are not still fed exclusively with breast milk. The prevalence of exclusive breastfeeding practice is different in other cities in Iran and has been reported 55.4% (22), 66.4% (23) and 41.5% in some studies (24). In general, the prevalence of breastfeeding behavior in less developed countries are much lower than the developed countries. In this regard, the results of a research showed that only 36% of infants were breastfed in the first 6 months in Bangladesh. A total of 53.9% and 43.7% of mothers practiced the exclusive breastfeeding for 4 and 6 months in Brazil (25). In Taiwan, only 16.7% of mothers had practiced exclusive breastfeeding for three months after delivery (26). However, previous studies by McDonald revealed that the exclusive breastfeeding was practiced in 61.6% of Canadian population (27). In a study in Scotland, Nielsen et al. showed that the mean breastfeeding behavior prevalence 15 and 25 weeks after birth was higher than other countries (28). The probable cause of differences in the prevalence of exclusive breastfeeding in different studies in different populations may indicate the impact of cultural, economic, social differences on the breastfeeding behavior of mothers in different communities. In the present study, there was a relationship between intention and breastfeeding behavior and infant's sex so that mothers who had given birth to a baby girl and mothers whose pregnancy was wanted and previous planning, were more willing to breastfeed, and this behavior was more

prevalent among them. This finding has also been reported in other studies (16). It seems that mothers' tendency to breastfeed their baby girl more than their baby boys is related with mothers' culture and beliefs in various communities. Probably the mother's perception that baby girls may be more vulnerable in this regard and thus more likely to need extensive care was more effective on their breast-feeding attitudes and behaviors. On the other hand, this behavior can be attributed to mothers' cultural belief that baby boys have more diverse nutritional needs and breastfeeding can't satisfy their nutritional needs; therefore, it is stopped in them sooner than the baby girls and they are fed with other foods. However, although there is such notion, it must be acknowledged that it is true and must be corrected by raising maternal awareness about the importance and effect of breastfeeding mothers on babies regardless of their gender. In this study, mothers who had wanted pregnancy were more willing to practice the exclusive breastfeeding behavior. In line with the results of this study, the research conducted by Haughton et al. showed that women who had wanted pregnancies were twice as likely to practice the breastfeeding behavior (29).

In a study, Hamade et al. also showed that wanted pregnancy affected breastfeeding adherence rate among mothers (7). It seems that designing and providing appropriate prevent unwanted pregnancy, providing appropriate training to prevent unwanted pregnancy and to increase wanted pregnancies, can be effective in improving breastfeeding behavior among mothers. Based on behavioral theories, although it is difficult to create many health-oriented behaviors, it is assumed that if individuals have a strong intention to perform a special behavior, they are more likely to perform the desired behavior than when the intention of the above behavior is weak. In the current study, there was a relationship between mothers' intention on their exclusive breastfeeding practice and the breastfeeding behavior was seen more in mothers who intended to breastfeed. According to the theory of planned behavior, the behavioral intention is affected by other factors such as attitudes, subjective norms, and perceived behavioral control. In the present study, there as a relationship between breastfeeding behavior and constructs, including attitudes, perceived behavioral control and behavioral intention (the desire to breastfeed), which predicted 13.8% of changes in the behavioral intention. In line with the results of the present study, the research conducted by Ismail et al. showed that constructs of theory of planned behavior predicted 51% of changes in the exclusive breastfeeding behavior (30).

In a study, McMillan et al. showed that constructs of attitudes, subjective norms, and perceived behavioral control, along with some other factors predicted the breastfeeding intention. Generally, constructs of theory of planned behavior (subjective norms, perceived behavioral control and behavioral intention) predicted 21% of changes in the breastfeeding behavior of nulliparous mothers. The results showed that attitude had no direct effect on the breastfeeding behavior and this construct affected the behavior only through affecting their intention. However, subjective norms directly affected the breastfeeding behavior of mothers and not through the intention. In a study, Bai et al. showed that constructs of theory of planned behavior had a significant role in predicting the breastfeeding behavior of mothers and factors related to the theory, predicted 50% of changes in the breastfeeding behavior. Among constructs of theory of planned behavior, the behavioral intention and then perceived behavioral control, were stronger predictors of breastfeeding behavior of

mothers (31). Since the present study was conducted in the city of Bushehr, it is impossible to generalize its results to other societies due to of cultural, social and economic differences. Also, the breastfeeding behavior was measured using self-report manner in the present study; therefore, there is a probability of error rate in the results.

4-1. Limitation of study

This study only determined predictors of intention to exclusive breast feeding and exclusive breast feeding behavior so there is need educational intervention to increase exclusive breast feeding in primipara women.

5- CONCLUSION

The results of this study showed that maternal beliefs are important factors affecting the exclusive breast-feeding behavior. The maternal intention was one of the most important effective components, which was strongly affected by the mothers' controlling ideas and attitude. The results also revealed that if mothers believe that breastfeeding behavior is under their control and generally evaluate this behavior as useful with positive results, intention and then exclusive breastfeed behavior are more likely to be practiced by them.

Implementing educational interventions during breastfeeding sessions and even during pregnancy period seems to be beneficial in creating a positive attitude and empowering mothers to achieve controlling beliefs. Since the abstract norms directly affected breastfeeding behavior of mothers and not through intention, it seems that the recommendations of physicians, nurses and other health professionals play a key role in mothers' adherence with the breastfeeding. Moreover, training husbands and other family members can also play an effective role in improving mothers' performance. Overall, constructs of theory of planned behavior are recommended as a framework for implementing educational interventions to correct and improve the maternal performance.

6- CONFLICT OF INTEREST: None.

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