

# Prenatal Interventional Program about Mothers' Behavior Related to Exclusive Breast Feeding: Findings of Planned Behavior Theory-Based Research

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**Background:** Promotion of exclusive breast feeding is known as a savior strategy, to reduce infantile mortality. The theory of planned behavior is an appropriate theory to explain the effect of psychosocial factors on infant feeding behavior. This study aimed to evaluate impact of planned behavior theory-based education on the behavior of pregnant women related to exclusive breast feeding in Arak city, 2016-17.

**Methods:** This study is an interventional study that was done on 101 pregnant women with gestational age of 32-28 weeks in health centers of Arak city. All individuals were divided into experimental and control groups randomly. Valid and reliable questionnaires were completed before, on and 3 months after intervention. Experimental group received educational intervention in 3 sessions. Data was analyzed using SPSS 16 software (Chi-square, T, R.M.ANOVA Tests).

**Results:** The results showed that, after implementation of the intervention, mean of scores for attitudes, subjective norms, Perceived behavioral control, intention and exclusive breast feeding behavior has increased significantly in the experimental group compared with the control group.

**Conclusion:** The findings of this study, showed the efficiency and effectiveness of educational intervention based on the theory of planned behavior on exclusive breast feeding behavior. Designing and implementing educational programs based on the theory of planned behavior is proposed to encourage women to breast-feed exclusively to encourage women to breast-feed exclusively.

**Key Words:** Exclusive breast feeding, Planned behavior theory, Training during pregnancy

## INTRODUCTION

Malnutrition, respiratory infections, and diarrhea have been major causes of infant mortality in recent years. Some reports indicate that breastfeeding can reduce these diseases substantially [1-3]. Results obtained from the data analysis of studies conducted in Asia, Africa, and Latin America showed that the risk of disease or death significantly increases when non-exclusive feeding begins for the infant sooner than 6 months, and about 1.06 million infant death

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occurs annually in these circumstances [4,5]. Unfortunately, there is a gap between the existing and the optimum method of infant nutrition. Exclusive breastfeeding is still at a low rate in many parts of the world, and the majority of women stop breastfeeding sooner than what is recommended (exclusive breastfeeding for the first six months) [1,6]. Many infants do not receive optimal nutrition. For example, only 38% of infants aged 0-6 months receive the benefit of exclusive breastfeeding globally [7]. Sometimes, despite knowing that breast milk should be the first substance fed to babies after birth, mothers often give pre-lacteal foods, such as water, honey, tinned milk, and fruit juice, to their babies [8]. In a report of 94 countries in 2003, WHO declared that only 35% of infants were exclusively breastfed for the first four months of life [9]. According to reports from the WHO and the Treatment and Medical Education of Iran, more than half of infants were deprived of exclusive breastfeeding before reaching 4 months of age. As a result, this reduction in the amount and duration of exclusive breastfeeding, which is now a health problem in developing countries, can lead to two or three times increase in malnutrition, infection, and infant death [10].

Thulier and Mercer conducted a meta-analysis to determine the factors affecting breastfeeding duration [11]. They classified the results into 4 groups: demographic, biological, social, and psychological factors. Social variables consisted of being employed, family support, the education and support of mothers by healthcare providers. In the context of psychological factors, anxiety, attitude, belief, propensity, interest, and trust in the role of a breastfeeding mother can be named as factors affecting breastfeeding duration [11]. It is critical to understand the modifiable factors of breastfeeding behavior. Modifiable behavioral factors have been broadly examined using the theory of planned behavior (TPB) [12], one of the most common health education and promotion models and theories. This theory is a social cognitive theory of expected value, which states that intention is the main determinant for behavior. The intention is also affected by three independent variables attitude, subjective norms, and perceived behavioral control [13].

To determine the effect of the constituent factors of TPB on the breastfeeding behavior of mothers and the im-

portance of exclusive breastfeeding to the health of children and the low rate of exclusive breastfeeding, this study was conducted to examine the effect of TPB-based educational intervention on the behavior of pregnant mothers toward exclusive breastfeeding in Arak.

## MATERIALS AND METHODS

### 1. Study design and sampling

This interventional study was conducted on pregnant women in Arak from 2015-2016. Sampling was done using a multistage method. Four centers were selected from 2 urban regions that had the same conditions and were far enough from each other to prevent training conflicts. Two centers were randomly assigned to the intervention group (n = 51), and the other two centers were randomly assigned to the control group (n = 51). Inclusion criteria consisted of being in the third trimester of pregnancy (28-32 weeks), having a singleton pregnancy, having minimum literature, having the propensity to participate in the study (see Fig. 1).

### 2. Study instrument

The data collection instrument was a researcher-created questionnaire based on TPB and the objectives of the research. Content validity was addressed using the qualitative method and opinions of 8 experts and scholars (in

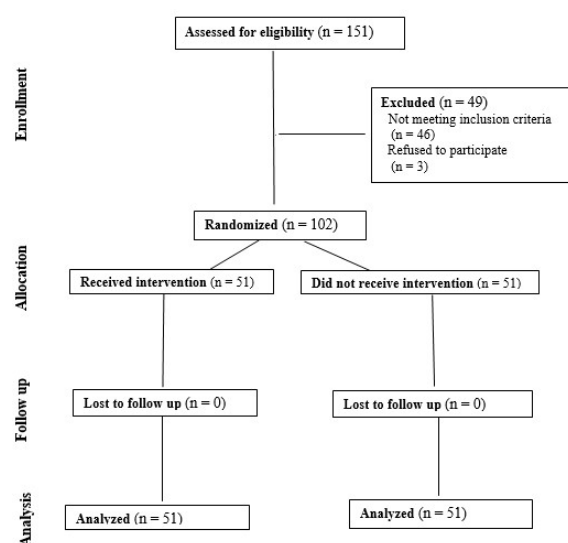


Fig. 1. CONSORT diagram showing the flow of participants through each stage.

health education and health promotion, including pediatrician, and epidemiologist). In general, the questionnaire included demographic questions, including age, educational levels of mother and her husband, job of the mother and her husband, number of children, economic status, childbirth decisions and selected childbirth, and TPB-based questions (including attitude, subjective norms, perceived behavioral control, and behavioral intention).

### 3. Intervention

After the results obtained from the pretest of the intervention group were analyzed, educational content, number of training sessions, required time for training in the context of each component of the TPB were ascertained based on predetermined training needs. Three educational sessions (two 2-hour sessions and one 1.5-hour session) were held for the experimental group consisting of intervention activities with a lecture, a PowerPoint presentation, a group discussion, a question and answer session, educational SMS (Short messages), the distribution of pamphlets to the mothers and their husbands, observation feedback of spouses, and an invitation to successful mothers and their doctors to centers to give a lecture.

### 4. Data analysis

The questionnaires were filled out before the training, one month after the training, and three months after intervention in healthcare centers. The obtained data were analyzed through SPSS16 software, an independent t-test, a chi-square test, and repetitive rates of RM ANOVA.

### 5. Ethical considerations

In this research, participants voluntarily entered into the study, and they were assured of its confidentiality. Coding was used in questionnaires in place of the participants' names.

### 6. Findings

The majority of the participants in the experimental group (64%) and the control group (60.8%) were in between the ages of 25 and 35; the education of these mothers was at the high school and college level, and 84% of the mothers in the experimental group and 84.3% in the control group were housewives. Eighty-two percent of the mothers in the experimental group and 82.4% in the control group had decided on their delivery method, and 72% of mothers

**Table 1.** Comparison of attitude, subjective norms, perceived behavioral control and behavioral intention scores before, 1 and 3 months after intervention in experimental & control groups

Variable		Experimental group (n=51)	Control group (n=51)	p (t-test)
		Mean ± SD	Mean ± SD	
Attitude	Before Intervention	65.4 ± 10.6	64.4 ± 9.3	p = 0.639
	1 month after Intervention	73.2 ± 6.9	65.5 ± 6.5	p < 0.001
	3 month after Intervention	74.9 ± 2.5	63.3 ± 9.5	p < 0.001
	Test P (RM.ANOVA)	p < 0.001	p = 0.134	
Subjective norms	Before Intervention	74.08 ± 20.4	73.09 ± 16.7	p = 0.792
	1 month after Intervention	84.9 ± 14.5	75.4 ± 15.9	p = 0.002
	3 month after Intervention	87.9 ± 10.4	72.6 ± 12.3	p < 0.001
	Test P (RM.ANOVA)	p < 0.001	p = 0.258	
Perceived behavioral control	Before Intervention	61.02 ± 20.7	57.6 ± 18.7	p = 0.387
	1 month after Intervention	76.96 ± 13.9	57.5 ± 19.8	p < 0.001
	3 month after Intervention	82.1 ± 9.5	53 ± 16.6	p < 0.001
	Test) P (RM.ANOVA)	p < 0.001	p = 0.48	
Behavioral intention	Before Intervention	8.3 ± 1.5	8.4 ± 1.3	p = 0.688
	1 month after Intervention	9.26 ± 0.696	8.3 ± 1.1	p < 0.001
	3 month after Intervention	9.9 ± 0.36	8 ± 1.17	p < 0.001
	Test P (RM.ANOVA)	p < 0.001	p = 0.007	

SD: standard deviation.

in the experimental group and 64.7% in the control group had chosen natural childbirth (normal delivery) as their delivery method.

There was no significant difference between the experimental and control groups in terms of the components of TPB, including attitude, subjective norms, perceived behavioral control, and behavioral intention using an independent t-test before implementation of the educational program; in contrast, this test indicated a significant difference between the two groups in terms of the TPB components 1 and 3 months after educational intervention. One and three months after intervention, the RM ANOVA test indicated significant changes in the experimental group compared to the time before intervention ( $p < 0.001$ ) in terms of the TPB components while there was no significant difference in the control group in terms of the components of attitude ( $p = 0.134$ ), perceived behavioral control ( $p = 0.48$ ), and subjective norms ( $p = 0.258$ ). However, there was a significant difference in terms of behavioral intention at the level of 0.05 ( $p = 0.007$ ), and this significance reduced the mean of behavioral intention in terms of exclusive breastfeeding at 1 and 3 months after intervention in the control group (Table 1).

## DISCUSSION

This study was conducted to determine the effect of a TPB-based intervention on the exclusive breastfeeding behavior of pregnant mothers in Arak.

Attitude about a behavior is one of the most important underlying variables of the TPB. The more optimal the attitude of a person toward a behavior, the more intention the person will have to exhibit that behavior [14]. The results obtained from the extant study imply a significant increase in the mean of the scores of the experimental group before and at 1 and 3 months after intervention, while there was no such finding in the control group. The mentioned finding was in line with results obtained from a study conducted by Zeidi et al. in the context of the effectiveness of educational intervention on exclusive breastfeeding among Primigravida women using the TPB, in which the mean score of the attitude of mothers in the experimental group was significantly increased after intervention, while there

was not any significant change in the control group [15]. A study was conducted by Ahmadi et al. to examine the effect of a TPB-based educational program on awareness and performance of breastfeeding among pregnant Primigravida women. The results of this study did not show any significant difference between groups in terms of the attitude mean score, and this result does not match the results of the present study [16]. Ahmadi et al. explained the reason for this finding in this way: attitude toward a certain action is attributed to a set of opinions toward an action or behavior, so these opinions must be changed for increasing the overall attitude; therefore, all factors should be considered if an attitude is projected to be changed [16]. This process requires time because the opinions and beliefs of people are not simply changed in the short term. Hence, more long-term education and training is required to achieve such a goal. The positive effect of attitude on exclusive breastfeeding has been reported in several different studies [17,18].

Subjective norms are attributed to the beliefs of a person about the confirmation or rejection of others about a specific behavior [19]. The subjective norms of women are effective in breastfeeding, so these norms are determinant factors in the beginning and continuation of breastfeeding [18]. In this research, the mean score of subjective norms in the experimental group was increased after intervention, while there was not any significant difference in the control group. A study was carried out by Ling Shi et al. about the effect of educational interventions on the nutrition of infants in China using the theory of planned behavior; this study was conducted on 485 mothers who had 2- to 4-month old babies, and the results obtained showed that the mental and subjective norms' scores in the intervention group were considerably higher than the scores of the control group [20], which is in line with the results of our research. An increase in the subjective norms' score was expected because key family members, healthcare personnel, and the husbands of the participating women were invited to this intervention to influence an understanding of these women.

Perceived behavioral control (PBC) is the understanding of a person about his/her control over a behavior [21]. In this study, there was a significant difference between groups

at 1 and 3 months after intervention regarding the scores of the PBC. There was a significant increase in PBC in the experimental group 1 and 3 months after intervention, while such an increase was not observed in the control group. Similar to our study, a study was conducted by Gheani et al. entitled the "effect of TPB-based educational program on promotion of performance of breastfeeding among mothers," in which the score of the PBC component in the experimental group increased significantly at 3 and 6 months after childbirth compared to the time before the intervention, while there was no significant difference in the control group [22]. Damstra carried out a study entitled "improvement of knowledge, self-efficacy, and intention of breastfeeding through an educational program before birth," in which it was indicated that it is necessary to pay attention to self-efficacy and knowledge of breastfeeding before childbirth so the breastfeeding intention can be positively affected [23]. Wu et al. carried out a study about the effects of breastfeeding self-efficacy interventions on the short-term consequences of breastfeeding among Primigravida women in Wuhan, China based on the conceptual framework of self-efficacy. This study was conducted on 74 mothers, and the findings showed that self-efficacy intervention is an effective method to increase self-efficacy, exclusive breastfeeding, and the duration of it among Primigravida women during the short term [24].

Intention plays a vital role in TPB. Intentions consist of effective incentive factors on behavior indicating how strongly people want to exhibit a behavior [21]. The results of our study showed that there was no significant difference between the mean scores of behavioral intention between the two groups before intervention, but after intervention, the difference between the experimental and control groups became significant at 1 and 3 months after intervention. There was a significant difference between the mean scores of behavioral intention of the mothers in the experimental and control groups in terms of exclusive breastfeeding 1 and 3 months after intervention, while this significance in the control group was directed toward reducing the mean score of behavioral intention. Zeidi et al. showed a positive effect of TPB-based educational intervention on the behavioral intervention of mothers [15]. The results of this study match the results obtained by Ahmadi et al. [16], and Damstra [23]

that show the effectiveness of TPB-based educational intervention on increasing the behavioral intention of mothers in terms of exclusive breastfeeding and exhibiting breastfeeding behavior.

The general objective of this study was to examine the effect of intervention on the exclusive breastfeeding behavior of pregnant mothers three months after the educational intervention; accordingly, there was a higher percentage of mothers using nonexclusive feeding (use of other foods, such as milk powder, sugar water, cow milk or other food stuff, in addition to breast milk) in the control group compared to the experimental group. This result was in line with results obtained from studies conducted by Zeidi et al. [15], Ghazani et al. [22], and Sharifirad et al. [18] indicating the positive effect of the TPB- and TRA-based intervention on the exclusive breastfeeding rate. Whereas, this result was not matched with results obtained from the studies of Ahmadi et al [16], and Karen Vambach et al. [24]. In a study conducted by Karen Vambach et al., the TPB-based educational intervention had no effect on breastfeeding beginning and the exclusive breastfeeding rate among mothers in the experimental group, while it did have an effect on exclusive breastfeeding duration during different time intervals until 6 months; different intervention methods and factors in this study may be the reasons for this difference. On the other hand, it should be noted that educational intervention may not be enough. It is necessary to identify the barriers to exclusive breast feeding. In a study by Barni et al., emphasis on identified feeding barriers, such as cultural barriers, and on improving exclusive breastfeeding suggested engaging mothers, the health system, and the broader community [25]. A study was carried out by Ling Shi et al [20], entitled "use of TPB to examine the effect of educational interventions on nutrition of 2- to 4-month-old infants in China," in which the score of the intervention group was considerably higher than the score of the control group considering feeding behaviors toward infants. These studies showed the positive effect of TPB-based educational programs on exclusive breastfeeding behavior, and the results of our research is in line with the results of the aforementioned studies.

Some of limitations in this research can be named as follows: possibility of bias in questionnaires reported by person,

effect of individual differences such as mental and moral characteristics and personal beliefs on learning, and effect of individual study and obtaining information from other references on results.

## CONCLUSION

This TPB-based educational interventional study could lead to improved attitudes, subjective norms, perceived behavioral control, and behavioral intentions of mothers in relation to exclusive breastfeeding behavior; this study also promoted exclusive breastfeeding performance. According to the findings of this study and other studies that indicated the positive effect of TPB-based educational programs on an increase in exclusive breastfeeding among mothers, it is recommended that training classes and TPB-based educational programs be held during pregnancy for mothers, providing training in exclusive breastfeeding and persuading mothers to participate in such classes during pregnancy.

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## REFERENCES

1. Black RE, Morris SS, Bryce J. Where and why are 10 million children dying every year? *Lancet* 2003; 361:2226-34.
2. Rodríguez L, Cervantes E, Ortiz R. Malnutrition and gastrointestinal and respiratory infections in children: A Public Health Problem. *Int J Environ Res Public Health* 2011;8:1174-205.
3. Morowatisharifabad M, Hajizadeh H, Akhavan Karbasi S, Fallahzadeh H. Study of the status of 6-12 months children exclusive breast-fed up to six months and its related factors in the urban health care centers of Ardakan city. *Tolooebehdasht* 2013;12:84-94.
4. Matias SL, Nommsen-Rivers LA, Dewey KG. Determinants of exclusive breastfeeding in a cohort of primiparous periurban peruvian mothers. *J Human Lact* 2012;28:45-54.
5. WHO: Guiding principles for feeding infants and young children during emergencies [Internet]. Geneva: World Health Organization; 2004 [cited 2016 Jun 29]. Available from [http://www.searo.who.int/entity/emergencies/documents/guiding\\_principles\\_for\\_feeding\\_infants\\_and\\_young\\_children\\_during\\_emergencies.pdf](http://www.searo.who.int/entity/emergencies/documents/guiding_principles_for_feeding_infants_and_young_children_during_emergencies.pdf)
6. Willumen J. Breastfeeding education for increased breastfeeding duration: Biological, behavioural, and contextual rationale. e-Library of Evidence for Nutrition Actions (eLENA) [Internet]. Geneva: World Health Organization.; 2013 [cited 2016 Jun 29]. Available from [https://www.who.int/elena/bbc/breast-feeding\\_education/en/](https://www.who.int/elena/bbc/breast-feeding_education/en/)
7. WHO: Infant and young child feeding [Internet]. Geneva: World Health Organization; 2018. [cited 2018 Feb 16]. Available from <https://www.who.int/media-centre/factsheets/fs342/en/>
8. Hackett KM, Mukta US, Jalal CS, Sellen DW. Knowledge, attitudes and perceptions on infant and young child nutrition and feeding among adolescent girls and young mothers in rural Bangladesh. *Matern Child Nutr* 2015;11:173-89.
9. WHO, UNICEF: Global strategy for infant and young child feeding [Internet]. Geneva: World Health Organization; 2003 [cited 2016 Jun 29]. Available from <https://www.who.int/nutrition/publications/infantfeeding/9241562218/en/>
10. Seighali F, Fallahi M, Farahani Z. The effect of breastfeeding workshop on attitude, knowledge and practice of participants. *Razi J Med Sci* 2014;21:92-101.
11. Thulier D, Mercer J. Variables associated with breastfeeding duration. *J Obstet Gynecol Neonatal Nurs* 2009; 38:259-68.
12. Johns HM, Forster DA, Amir LH, McLachlan HL. Prevalence and outcomes of breast milk expressing in women with healthy term infants: a systematic review. *BMC Pregnancy Childbirth*, 2013;13:212.
13. Ajzen I. The theory of planned behavior. *Organ Behav Hum Decis Process* 1991;50:179-211.
14. Schulz KF, Altman DG, Moher D. CONSORT 2010 statement: Updated guidelines for reporting parallel group randomised trials. *BMC Med* 2010;8:18.
15. Mohammadi Zeidi I, Pakpour Hajiagha A, Mohammadi Zeidi B. Effectiveness of educational intervention on exclusive breast feeding in primipara women: application of planned behavior theory. *Razi J Med Sci* 2015; 21:12-23.
16. Ahmadi M, Jahanara S, Moeini B, Nasiri M. Impact of educational program based on the theory of planned behavior on primiparous pregnant women's knowledge and behaviors regarding breast feeding. *J Health and*

- Care 2014;16:19-31.
17. Gijssbers B, Mesters I, Knottnerus JA, Schayck CPV. Factors associated with the initiation of breastfeeding in asthmatic families: The attitude-social influence-self-efficacy model. *Breastfeed Med* 2006;1:236-46.
  18. Sharifirad GR, Golshiri P, Shahnazi H, Barati M, Hasanzadeh A, Charkazi A, Moudi M. The impact of educational program based on BASNEF model on breastfeeding behavior of pregnant mothers in Arak. *Arak Med Univ J* 2010;1:63-70.
  19. Glanz K, Rimer BK, Viswanath K. Health behavior and health education: theory, research, and practice. (4th ed). John Wiley & Sons: San Fransisco, CA. 2008.
  20. Zhang J, Shi L, Chen D, Wang J, Wang Y. Using the theory of planned behavior to examine effectiveness of an educational intervention on infant feeding in China. *Prev Med* 2009;49:529-34.
  21. Armitage CJ, Conner M. Efficacy of the theory of planned behaviour: A meta-analytic review. *British J Soc Psychol* 2001;40:471-99.
  22. Mahbubi Ghazaani F, Roozbahani N, Shamsi M. Predictive factors of exclusive breastfeeding intention in pregnant women. *Arak Med Univ J* 2015;18:68-76.
  23. Damstra KM. ImProving breastfeeding knowledge, self-efficacy and intent through a prenatal education program [Dissertation]. Allendale, MI: Grand Valley State University; 2012.
  24. Wambach KA, Aaronson L, Breedlove G, Domian EW, Rojjanasrirat W, Yeh HW. A randomized controlled trial of breastfeeding support and education for adolescent mothers. *West J Nurs Res* 2011;33:486-505.
  25. Nor B, Ahlberg BM, Doherty T, Zembe Y, Jackson D, Ekström EC. Mother's perceptions and experiences of infant feeding within a community-based peer counseling intervention in South Africa. *Matern Child Nutr* 2012;8:448-58.