Health Scope. 2020 August; 9(3):e100277. doi: 10.5812/jhealthscope.100277.

Published online 2020 July 19. **Research Article**

Effect of Education Based on Extended Theory of Planned Behavior on Exclusive Breastfeeding in Pregnant Women in Darmian in 2017

Hajar Rasoli [1], Gholamreza Masoudy [2,*], Hossein Ansari [2] and Hossein Bagheri [3]

[1] Birjand University of Medical Sciences, Birjand, Iran
[2] Health Promotion Research Center, Zahedan University of Medical Sciences, Zahedan, Iran
[3] Department of Medical English, School of Medicine, Zahedan University of Medical Sciences, Zahedan, Iran

[*] *Corresponding author*: Public Health Group, School of Health, Zahedan University of Medical Sciences, Dr. Hesabi Sq., Zahedan, Iran. Tel: +98-9155404262, Fax: +98-5433295837, Email: masoudy55@yahoo.com

Received 2020 January 12; **Revised** 2020 March 11; **Accepted** 2020 April 13.

Abstract

Background: Appropriate breastfeeding reduces health disorders and death among infants.
Objectives: The present study was conducted to evaluate the effects of educational intervention based on the extended theory of planned behavior.
Methods: In this semi-experimental study, 168 pregnant women from 20 health centers were allocated into intervention and control groups by a multi-stage sampling method. The data collecting tool included demographic and constructs of an extended theory of planned behavior. The validity and reliability of the questionnaire were confirmed by an expert panel and Cronbach's alpha test, respectively. The educational methods encompassed face to face training, pamphlet and flashcards distribution, and clip presentation. Two 45-minute educational sessions were conducted; the data were recollected 6 months after the delivery.
Results: The mean ages of the intervention and control group were 29 $\pm$ 6 and 28.7 $\pm$ 5.9. The pregnancy rate and age of the pregnancy in the intervention group were 2.7 $\pm$ 1.4 and 29 weeks, respectively. After the intervention, the mean score of the behavior in the intervention group increased compared to the control group. The intention (B = 0.4, P = 0.01) and perceived behavior control (B = 0.42, P = 0.03) were the predictors of the behavior.
Conclusions: The structures of the extended theory of planned behavior are suitable framework to promote exclusive breastfeeding among pregnant women.

Keywords: Education, Exclusive Breast Feeding, Pregnant Women

1. Background

Breast milk is considered the best food for babies. Exclusive breastfeeding (EBF) for six months can decrease by 13 % of children's mortalities in developing countries. Non-exclusive breastfeeding may cause 55% and 53% of diarrheal and acute respiratory deaths. In fact, 1.24 million deaths that occur during the first 6 months of life are associated with non-exclusive breastfeeding (1-7). Universally, the results have shown that only 35% of babies were exclusively breastfed during their first 4 months of life (7-9).

In 1997, the National Breastfeeding Center merged to "Children's Health Office". According to the Iranian demographic and health survey, the practice of mothers in breastfeeding improved (10). Later, the Iranian multiple indicator demographic and health survey showed that EBF increased to 27.8% and 62.8 % in the urban and rural areas, respectively (10).

Considering the significant difference between WHO recommendations for exclusive breastfeeding and its practices in Iran and on the world, the educational interventions are necessary for promoting the mother's practices (10-15).

The Theory of Planned Behavior (TPB) suggests that individual behaviors are motivated by behavior intentions which is a function of three factors including the individual's attitude toward behavior, subjective norms, and perceived behavioral control (11-14).

Attitude is a feeling opinion about someone or something that refers to the evaluative effects of the positive or negative feelings of persons in performing a specific behavior. Subjective norms reflect the perceived social pressure from significant others to perform or not to perform a specific behavior (16-18).

Perceived behavioral control refers to the individuals' perceptions of their capability to do breastfeeding. Generally, if individuals have a positive attitude or a strong feeling about reference groups or individuals, such a feeling

will approve their breastfeeding, and if they perceive that, they will be able to perform the breastfeeding or have control over their performance (16-18).

In recent years, many efforts have been made to develop the TPB and adapt it for intervening on different behaviors. Legal and illegal drug use, predicting blood donation intentions, predicting the retention of first-time donors, cancer screening intention, exercise behavior, and predict the intention of EBF were some of the interventions based on the extended theory of planned behavior (19-26).

Moral norm and self-identity were the constructs that Professor Mark Conner added to TBB for predicting the behavior of exclusive breastfeeding. Moral norms can be considered as a person's perception about the moral accuracy of a behavior. Self-identity may be considered as the relatively continuing specs that people attribute to themselves (16).

2. Objectives

Promoting breastfeeding to reduce the mortality and morbidity in mothers and children demands some innovative programs. Therefore, a theoretical educational program was designed and implemented to evaluate the predictive role of the two constructs of moral norms and self-identity constructs associated with the expanded theory of planned behavior.

3. Methods

In this semi-experimental study, we randomly allocated 20 healthcare houses of 42 primary health care houses into control and intervention groups by a multistage sampling method. Then we used two independent samples with continuous outcomes. It was assumed the $P < 0.05$ as acceptable and a study with 80% power. Therefore, $Z_1 - \alpha/2$ and $Z_1 - \beta$ was gotten the values 1.96 and 0.8416, respectively. The effect size was considered as 80. Calculating for a 10% drop-out rate, one would need to complete approximately 90 patients per arm.

3.1. Inclusion Criteria and Exclusion Criteria

Voluntarily participation and those who were in their third trimester were induced, and those who were not satisfied enough to continue in the research and were absent in the educational program were excluded.

3.2. Data Collection Tool

The data collecting tool was a researcher-made questionnaire containing demographic and specialized questions. The participant's situations (e.g., pregnancy, age, education, and occupation) were surveyed. Also, specialized questions were developed based on the extended theory of planned behavior and designed according to the exclusive breastfeeding.

The accuracy of the questions was approved by content validity and reliability. The reliability of the questions was surveyed via Cranach's alpha coefficient test. All of the items have reliability and validity over 70% and 80%, respectively.

To measure the responses to the knowledge questions, for correct, incorrect, and I do not know" answers, 2, 0, and 1 were scored, respectively.

Also, the responses of TPB constructs including, attitude, subjective norm, perceived behavior control, behavioral intention, moral norm and Self-identity were designed based on the guideline of the Theory of Planned Behavior. The questionnaire was designed at seven levels of Likert scales, including extremely agree, quite agree, slightly agree, neither agree nor disagree, slightly disagree, quite disagree and extremely disagree that scored from 1 to 7.

The behavioral question was whether or not the baby was exclusively breastfed in the last six months, assigning 1 and 0 for each yes or no answer, respectively.

3.3. Procedure

After achieving the ethics approval and coordinating the study, the objectives were explained and the written informed consent was obtained from all patients. Then, the research questionnaires were distributed, and the primary data were collected and analyzed.

Based on the need assessment, the educational content, methods, media, and learning sessions were designed and developed. In this study, the main educational method was face to face approach conducted in the health centers. All of the pregnant women were interviewed, and an educational pamphlet was delivered. Based on the educational curriculum for husbands of the women as subjective norms, an educational pamphlet about supporting the role of spouses was designed and distributed.

Also, to promote the mean scores of moral norms and self-identity constructs, According to the social conditions and positive attitude of family members to sharia law and the importance of breastfeeding in the Holy Quran a clergyman and a pediatrician as educators participated in the educational sessions.

For attitude changes, all of the women participated in focus group discussion (5 - 7 women in each group), for perceived behavior control promoting, direct and indirect experiences method were used, respectively. Then in the second educational session, an educational pamphlet was distributed among pregnant women. After delivery, mobile messages associated with exclusive breastfeeding

were sent to pregnant women. The data were recollected and compared after six months.

This study was registered in Zahedan University of Medical Sciences with an ethical number of IR. ZAUMS. 1396.56.

3.4. Data Analysis

The Kolmogorov-Smirnov test was used to determine the normality of data; the data analysis was conducted via non-parametric tests.

The mean, percentage, and standard deviation were used to describe the data, while the Mann-Whitney test, Spearman correlation coefficient test, logistic regression, and chi-square test were used to analyze the data. Furthermore, the level of significance for the tests was considered at 0.05.

4. Results

In this study, 168 pregnant women were studied in two groups. The mean age of participants in intervention and control groups were 29 ± 6 and 28.7 ± 5.9, respectively (P = 0.25).

There were no statistically significant differences between the two groups in terms of age, number of pregnancies, live birth numbers and literacy levels ($P < 0.05$); however, a significant difference was observed between two groups in terms of gestational age, controlled by linear regression (Table 1).

After training, the mean scores of knowledge, attitude, subjective norms, moral norms, self-identity, and perceived behavioral control in the experimental group significantly increased, and a significant difference was observed between control and case group ($P < 0.0001$) (Table 2).

Based on the results, in demographic characteristics between two groups, no differences were seen.

According to Table 2, in the intervention group, the mean scores of all of the constructs compared to the control group after the intervention increased meaningfully, but attitude and self-identity have the greatest (14.6%), and the least (8.7) mean differences, respectively.

According to Table 3, the study of EBF behavior showed that after childbirth, the rate of EBF in the intervention group was higher than control (N = 11).

According to Table 4, results of the logistic regression analysis between EBF and constructs of the model showed that behavioral intention was the only predictive variable for behavior (P = 0.001), (OR = 1.62).

Table 1. Comparison of the Demographic Characteristics in the Research Groups[a]

Variables	Research Groups		P Value
	Intervention	Control	
Age	29.2 ± 6	28.7 ± 5.9	0.61
Number of birth	2.8 ± 1.3	2.5 ± 1.5	0.25
Number of live birth	1.4 ± 0.9	1.3 ± 1.23	0.72
Employment (women)			0.96
Unemployed	80	78	
Employee	4	5	
Employment (husbands)			0.38
Unemployed	10	12	
Employee	9	14	
Self-employed	66	57	
Education (women)			0.52
Elementary school	35	26	
Secondary school	15	16	
Diploma	23	24	
College education	12	17	
Education (husbands)			0.491
Elementary school	46	38	
Diploma	38	30	
College education	11	15	

[a]Values are expressed as mean ± SD or number.

5. Discussion

In general, the study results showed that theoretical training intervention particularly, the extended theory of planned behavior, increases the EBF as a main and significant behavior in pregnant women which shows the efficiency of these educational programs. This finding is similar to the results of numerous studies in this area (20).

Considering to the rural situation of the research environment, the researchers emphasized on social variables, especially, family and religious support. Community support has a great and effective role in the success of educational programs. These results have been confirmed in various studies aimed to promote self-care behaviors in different situations (16, 17).

The results showed that after the educational intervention, the mean scores of knowledge and attitude in the case group, unlike the control group, significantly increased, and a mean difference was seen between two groups. Based on the TPB model attitude has a direct impact on intention and intention has a direct impact on behavior. Therefore, if a woman has a positive attitude regarding EBF, she will have a stronger intention to accept the EBF as a healthy be-

Table 2. Comparison of the mean scores of the extended theory of planned behavior constructs in the research groups before and after the intervention

Construct, Research Groups	Intervention					
	Before			After		
	Mean ± SD	Percent of Total Score	P Mann Whitney	Mean ± SD	Percent of Total Score	P Mann-Whitney
Knowledge			0.52			0.001
Intervention	12.8 ± 2.2	79.8		15.3 ± 1.3	95.9	
Control	12.7 ± 2,64	80		12.9 ± 2.2	80.7	
Attitude			0.44			0.001
Intervention	72.2 ± 10.7	79.4	5	85.5 ± 5.2	94	
Control	73.6 ± 8.9	80.8		73.7 ± 7.8	81	
Subjective norms			0.18			0.001
Intervention	58.7 ± 8	83.9		64 ± 5	91.5	
Control	60.6 ± 6.7	86.6		60.7 ± 6.2	86.7	
Moral norms			0.445			0.001
Intervention	30.1 ± 3.6	86.1		33.3± 2.2	95.3	
Control	29.5 ± 3.7	84.4		30.3 ± 3.2	86.6	
Self-identity			0.493			0.001
Intervention	24.6 ± 2.9	88.1		27.1 ± 1.1	96.8	
Control	24.6 ± 2.2	87.9		24.6 ± 2.1	88.2	
Perceived behavior control			0.75			0.001
Intervention	28.6 ± 4.3	81.8		32.5 ± 2.6	93.1	
Control	28.7 ± 4.5	82.2		28.8 ± 4	82.4	
Intention			0.09			0.001
Intervention	30.1 ± 4.5	86.2		33.2 ± 2	95	
Control	29.9 ± 3	85.6		30.9 ± 2.7	88.3	

Table 3. Comparison of Behavior in Intervention and Control Groups After Education[a]

Group	Exclusive Breastfeeding for 6 Months	No Exclusive Breastfeeding for 6 Months
Intervention	75 (88)	10 (12)
Control	64 (77)	19 (23)
	$\chi^2 = 3.64$	P = 0.044

[a]Values are expressed as number (%).

Table 4. Logistic Regression Analysis Between Exclusive Breast Feeding and Constructs of the Theory

Constructs of Model	B	Standard Error	P Value	OR
Subjective norms	0.053	0.049	0.279	1.055
Moral norms	0.110	0.099	0.269	0.896
Self- identity	0.039	0.149	0.796	1.039
Perceived behavior control	0.113	0.090	0.209	1.120
behavioral intention	0.488	0.12	0.001	1.629

havior. These findings were consistent with the results of similar studies (15). Similarly, our findings showed that after the intervention, the mean score of the norm in the experimental group, unlike the control group, increased significantly and the mean difference between the two groups was observed. This means that women perceived more social pressure to perform EBF as a health behavior (25, 26).

Also, after the intervention, the mean score of the perceived behavioral control in the experimental group improved significantly, and a mean difference was seen between the two groups. This means that women feel more perceived behavioral control associated with increasing the women's perceptions of their ability to perform EBF and nourish their babies (12-19).

The construct of self-identity states that the perception or recognition of one's characteristics is a particular individual characteristic, especially in relation to social context. After the intervention, the mean score of self-identity

increased in the intervention group, which means that women accepted the fact that breastfeeding was an important part of their motherhood role (15).

After the intervention, the women in the experimental group had a higher mean score of moral norms about breastfeeding than the control group. They believed that breastfeeding was a moral norm in the community, and mothers should breastfeed their babies (17).

The results show that perceived behavioral control has a significant effect on exclusive breastfeeding; however, attitude in some researches had a higher impact on behavior (26).

In this study, findings showed that intention was the only predictive variable for exclusive breastfeeding (Table 4). According to the assumptions of the theory of planned behavior, behavioral intention is the strongest predictor for behavior, which has been proven in numerous studies (19, 22-24). In contrast to these results in different studies, other model structures, including behavioral control, were the strongest predictor for behavior (25).

5.1. Limitations

Since it was not possible for the husbands to participate in training sessions, a training package was designed for them to compensate for this limitation.

5.2. Conclusions

Considering the findings of this study, after the intervention, the EBF in the intervention group was significantly increased due to the educational program. Therefore, it can be concluded that the extended theory of planned behavior is a suitable basic framework to promote the rate of EBF.

Also, the constructs of behavioral intention and perceived behavioral control were the significant predictors of EBF (Table 4). In this study, two new constructs could not predict the behavior, though they had a great impact on behavioral intention as a mediator of the behavior. As a result, considering the cultural differences, it is suggested that more studies be conducted.

Acknowledgments

This study is an M.A. thesis registered in Zahedan University of Medical Sciences. The authors thanked of research deputy of Zahedan University of Medical Sciences and the all mothers participating in the study.

Footnotes

Authors' Contribution: Study concept and design: Gholamreza Masoudy and Hajar Rasoli; analysis and interpretation of data: Hossein Ansari and Gholamreza Masoudy; drafting of the manuscript: Gholamreza Masoudy; critical revision of the manuscript for important intellectual content: Hossein Bagheri and Gholamreza Masoudy; statistical analysis: Hossein Ansari.

Conflict of Interests: There is no conflict of interest.

Ethical Approval: This study was registered in Zahedan University of Medical Sciences with an ethical number of IR. ZAUMS. 1396.56.

Funding/Support: The study was supported by the Deputy of Research of Zahedan University of Medical Sciences.

Patient Consent: Written informed consent was obtained from all patients.

References

1. Haroon S, Das JK, Salam RA, Imdad A, Bhutta ZA. Breastfeeding promotion interventions and breastfeeding practices: a systematic review. *BMC Public Health*. 2013;**13 Suppl 3**. S20. doi: 10.1186/1471-2458-13-S3-S20. [PubMed: 24564836]. [PubMed Central: PMC3847366].
2. Al Mamun A, O'Callaghan MJ, Williams GM, Najman JM, Callaway L, McIntyre HD. Breastfeeding is protective to diabetes risk in young adults: a longitudinal study. *Acta Diabetol*. 2015;**52**(5):837–44. doi: 10.1007/s00592-014-0690-z. [PubMed: 25539880].
3. Tewabe T, Mandesh A, Gualu T, Alem G, Mekuria G, Zeleke H. Exclusive breastfeeding practice and associated factors among mothers in Motta town, East Gojjam zone, Amhara Regional State, Ethiopia, 2015: a cross-sectional study. *Int Breastfeed J*. 2016;**12**:12. doi: 10.1186/s13006-017-0103-3. [PubMed: 28261318]. [PubMed Central: PMC5327553].
4. Gupta A, Suri S, Dadhich JP, Trejos M, Nalubanga B. The World Breastfeeding Trends Initiative: Implementation of the Global Strategy for Infant and Young Child Feeding in 84 countries. *J Public Health Policy*. 2019;**40**(1):35–65. doi: 10.1057/s41271-018-0153-9. [PubMed: 30538269].
5. Wu X, Jackson RT, Khan SA, Ahuja J, Pehrsson PR. Human Milk Nutrient Composition in the United States: Current Knowledge, Challenges, and Research Needs. *Curr Dev Nutr*. 2018;**2**(7):nzy025. doi: 10.1093/cdn/nzy025. [PubMed: 30087951]. [PubMed Central: PMC6063275].
6. Hunegnaw MT, Gezie LD, Teferra AS. Exclusive breastfeeding and associated factors among mothers in Gozamin district, northwest Ethiopia: a community based cross-sectional study. *Int Breastfeed J*. 2017;**12**:30. doi: 10.1186/s13006-017-0121-1. [PubMed: 28702071]. [PubMed Central: PMC5504831].
7. Alebel A, Tesma C, Temesgen B, Ferede A, Kibret GD. Exclusive breastfeeding practice in Ethiopia and its association with antenatal care and institutional delivery: a systematic review and meta-analysis. *Int Breastfeed J*. 2018;**13**:31. doi: 10.1186/s13006-018-0173-x. [PubMed: 30026786]. [PubMed Central: PMC6048887].
8. Robinson H, Buccini G, Curry L, Perez-Escamilla R. The World Health Organization Code and exclusive breastfeeding in China, India, and Vietnam. *Matern Child Nutr*. 2019;**15**(1). e12685. doi: 10.1111/mcn.12685. [PubMed: 30194804]. [PubMed Central: PMC7199093].
9. Adugna B, Tadele H, Reta F, Berhan Y. Determinants of exclusive breastfeeding in infants less than six months of age in Hawassa, an urban setting, Ethiopia. *Int Breastfeed J*. 2017;**12**:45. doi: 10.1186/s13006-017-0137-6. [PubMed: 29142586]. [PubMed Central: PMC5669024].
10. Kalantari N, Haghighian Roudsari A. Breastfeeding Promotion in Iran: Opportunities and Challenges. *Journal of Comprehensive Pediatrics*. 2013;**4**(4):165–6. doi: 10.17795/compreped-12327.
11. Yeung H, Leff M, Rhee KE. Effect of Exclusive Breastfeeding Among Overweight and Obese Mothers on Infant Weight-for-

Length Percentile at 1 Year. *Breastfeed Med*. 2017;**12**:39–47. doi: 10.1089/bfm.2016.0071. [PubMed: 27834508].
12. Wojcicki JM, Heyman MB, Elwan D, Lin J, Blackburn E, Epel E. Early exclusive breastfeeding is associated with longer telomeres in Latino preschool children. *Am J Clin Nutr*. 2016;**104**(2):397–405. doi: 10.3945/ajcn.115.115428. [PubMed: 27440083]. [PubMed Central: PMC4962153].
13. Hellwig K, Rockhoff M, Herbstritt S, Borisow N, Haghikia A, Elias-Hamp B, et al. Exclusive Breastfeeding and the Effect on Postpartum Multiple Sclerosis Relapses. *JAMA Neurol*. 2015;**72**(10):1132–8. doi: 10.1001/jamaneurol.2015.1806. [PubMed: 26322399].
14. Wambach K, Domian EW, Page-Goertz S, Wurtz H, Hoffman K. Exclusive Breastfeeding Experiences among Mexican American Women. *J Hum Lact*. 2016;**32**(1):103–11. doi: 10.1177/0890334415599400. [PubMed: 26289059]. [PubMed Central: PMC4710489].
15. Walingo MK, Mutuli LA. Applicability of Theory of Planned Behavior in understanding Breastfeeding Intention of Postpartum Women. *Int J Multidisciplin Curr Res*. 2014;**2**.
16. McMillan B, Conner M, Woolridge M, Dyson L, Green J, Renfrew M, et al. Predicting breastfeeding in women living in areas of economic hardship: Explanatory role of the theory of planned behaviour. *Psychol Health*. 2008;**23**(7):767–88. doi: 10.1080/08870440701615260. [PubMed: 25160880].
17. Kaplan S, Manca F, Nielsen TAS, Prato CG. Intentions to use bike-sharing for holiday cycling: An application of the Theory of Planned Behavior. *Tourism Management*. 2015;**47**:34–46. doi: 10.1016/j.tourman.2014.08.017.
18. Jun J, Arendt SW. Understanding healthy eating behaviors at casual dining restaurants using the extended theory of planned behavior. *International Journal of Hospitality Management*. 2016;**53**:106–15. doi: 10.1016/j.ijhm.2015.12.002.
19. Ferreira G, Pereira MG. Physical activity: The importance of the extended theory of planned behavior, in type 2 diabetes patients. *J Health Psychol*. 2017;**22**(10):1312–21. doi: 10.1177/1359105315626787. [PubMed: 26841795].
20. Tengku Ismail TA, Wan Muda WA, Bakar MI. The extended Theory of Planned Behavior in explaining exclusive breastfeeding intention and behavior among women in Kelantan, Malaysia. *Nutr Res Pract*. 2016;**10**(1):49–55. doi: 10.4162/nrp.2016.10.1.49. [PubMed: 26865916]. [PubMed Central: PMC4742311].
21. Yang K. Consumer technology traits in determining mobile shopping adoption: An application of the extended theory of planned behavior. *Journal of Retailing and Consumer Services*. 2012;**19**(5):484–91. doi: 10.1016/j.jretconser.2012.06.003.
22. Xiao W, McClung SR. Toward a detailed understanding of illegal digital downloading intentions: An extended theory of planned behavior approach. *New Media & Society*. 2011;**13**(4):663–77. doi: 10.1177/1461444810378225.
23. Lin H. Applicability of the Extended Theory of Planned Behavior in Predicting Job Seeker Intentions to Use Job-Search Websites. *International Journal of Selection and Assessment*. 2010;**18**(1):64–74. doi: 10.1111/j.1468-2389.2010.00489.x.
24. McMillan B, Conner M, Green J, Dyson L, Renfrew M, Woolridge M. Using an extended theory of planned behaviour to inform interventions aimed at increasing breastfeeding uptake in primiparas experiencing material deprivation. *Br J Health Psychol*. 2009;**14**(Pt 2):379–403. doi: 10.1348/135910708X336112. [PubMed: 18980709].
25. de Leeuw A, Valois P, Ajzen I, Schmidt P. Using the theory of planned behavior to identify key beliefs underlying pro-environmental behavior in high-school students: Implications for educational interventions. *Journal of Environmental Psychology*. 2015;**42**:128–38. doi: 10.1016/j.jenvp.2015.03.005.
26. Miller MD, Furman M, Jackson L. Behavioral Intentions of Performance on Student Evaluation of Course Quality: An Application of the Theory of Planned Behavior. *Academy of Educational Leadership Journal*. 2018;**22**(2):1–2.