

# Study of exclusive breastfeeding behaviour based on the theory of planned behaviour in pregnant women in Isfahan in 2021

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**A** – Study Design, **B** – Data Collection, **C** – Statistical Analysis, **D** – Data Interpretation, **E** – Manuscript Preparation, **F** – Literature Search, **G** – Funds Collection

**Summary Background.** Exclusive breastfeeding (EBF) refers to feeding the baby with breast milk until the end of six months after birth. **Objectives.** This study aimed to study EBF behaviour based on the theory of planned behaviour (TPB) in pregnant women in Isfahan in 2021.

**Material and methods.** This cross-sectional study was conducted on 441 pregnant women in Isfahan with more than 20 weeks of pregnancy in 2021. The TPB constructs such as behavioural beliefs, outcome evaluation, normative beliefs, motivation to follow, control beliefs, perceived power, and behavioural intent on exclusive feeding behaviour were assessed. Sampling was simple randomised. We used an online questionnaire based on TPB constructs. The data was analysed with descriptive and analytic statistic.

**Results.** The mean age of participants was  $29.82 \pm 5.138$  years. There was a positive and significant relationship between the constructs of behavioural beliefs, normative beliefs, motivation to follow, control beliefs, perceived power ( $p = 0.000$ ) and outcome evaluation ( $p = 0.002$ ) with the intention of behaviour and an inverse relationship between these constructs and behaviour ( $p < 0.05$ ). However, there was a significant relationship between the number of children and the decision for the type of delivery ( $p < 0.001$ ) and the type of pregnancy ( $p = 0.014$ ) with the intention of EBF behaviour ( $p < 0.05$ ). The variables of behavioural beliefs, outcome evaluation, control beliefs and intention were selected as the most critical structures for predicting behaviour. According to this model, 29.1% of changes in EBF behaviour with these structures are also predicted.

**Conclusions.** Based on the results, unplanned pregnancy and the decision for the type of delivery had a significant relationship with behavioural intention for EBF. Thus, effective education concerning positive attitudes and support in performing EBF are necessary.

**Key words:** breast feeding, behavior, pregnancy, attitude.

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## Background

Exclusive breastfeeding (EBF) refers to feeding the baby with breast milk until the end of six months after birth without using water, food and powdered milk, except for cases that require the use of oral rehydration salt, vitamins, oral minerals, and medications [1]. According to the World Health Organization, UNICEF, the American Academy of Pediatrics and the Centers for Disease Control and Prevention, breast milk is the gold standard for infant nutrition and a priority for pregnant and lactating mothers [2, 3]. Exclusive breastfeeding has been gaining much attention due to reducing the susceptibility to various infections, diarrheal and bone diseases, malnutrition, diabetes, allergies, asthma and sudden infant death syndrome, as well as in ensuring the child's physical and emotional development [1, 4, 5]. It should be noted that the utmost benefit of these benefits depends on exclusive breastfeeding up to six months after birth [6].

Breastfeeding is an acquired skill that requires patience and support from loved ones and health workers [7]. Improper breastfeeding practices are critical public health issues worldwide, with previous studies showing that an average of 40% of

children worldwide are exclusively breastfed by the age of six months [8]. This statistic has risen from 23% to 51% in Iran over the past ten years despite exclusive breastfeeding promotion programmes, which is still unacceptable [9, 10]. By improving the factors affecting EBF as an integral part of the reproductive process, as well as complementary feeding, the lives of 5,000 children around the world could be saved daily [11].

There is a considerable number of studies stating the importance of education on the breastfeeding behaviour of mothers around the world and in Iran. According to a study by Cascone et al., educating mothers about the benefits of EBF for themselves and their children still requires effort and planning [12]. In the study by Panahi et al., the authors investigated the positive effect of education on increasing mothers' and fathers' knowledge, attitude and practice concerning successful breastfeeding [2]. Therefore, it is necessary to perform interventions to increase the amount of EBF.

In general, the practical improvement of health behaviour through education requires a process that leads to the intention and decision of the individual to implement the desired behaviour [13]. Therefore, the use of human behaviour mod-



els is recommended to identify the factors affecting exclusive breastfeeding behaviour [14]. Applying the theory of planned behaviour can increase the amount of exclusive feeding and its continuity [15]. Using this theory increases the self-efficacy of pregnant mothers to breastfeed and can be a suitable guide framework for breastfeeding and if they imagine that the behavior is controlled (perceived behavioural control), they intend to do it [16]. Belief in the consequences of behaviour and evaluation of that behaviour's consequences form the attitude. One's beliefs about the expectations of others and one's motivation to meet those expectations affect mental norms. How a person feels that he/she has control over whether or not to perform a behaviour is a perceived behavioural control (PBC) [1, 17]. In addition, increased PBC in multiparous women alone leads to an increase in EBF intent [18].

The study by Guo et al. on the exclusive intention to breastfeed in pregnant mothers based on the TPB showed that this theory provides a suitable framework for explaining the intention of exclusive breastfeeding in pregnant women [14]. In addition, the findings of the study by Rahimi et al. using this theory, they predicted the intention of EBF until the end of six months after delivery in 92.5% of 240 pregnant women in Qom [1].

In the study by Yu Zhu et al., an intervention based on the TPB, performed six weeks after delivery, increased the amount of EBF [19]. A study in Bangladesh counted age, education and occupation of the mother, education and occupation of the father, receiving prenatal and postnatal care, access to mass media such as television, number of children and type of delivery as the socio-demographic factors affecting exclusive feeding behaviour [20].

According to the importance of breastfeeding and the role of factors such as behavioural beliefs, outcome evaluation, normative beliefs, motivation to follow, control beliefs, perceived power and behavioural intent on exclusive feeding behaviour and the lack of studies based on the role of different theories and low EBF statistics, the present study was designed to investigate the factors affecting EBF based on the structures of the planned behaviour model in Isfahan. In line with previous studies [21, 22], in order to increase the generalisability of the results, this study was performed on pregnant women referring to comprehensive health service centres in different parts of Isfahan in terms of cultural, social and economic status.

## Material and methods

This cross-sectional study was conducted on 441 pregnant women who had been referred to comprehensive health service centres in Isfahan with more than 20 weeks of pregnancy in 2021. Literacy, ability to use the Internet and willingness to participate in the study were the entrance criteria. The exclusion criteria were maternal delivery, intrauterine death and maternal contraceptive diseases.

Study participants were randomly selected. Isfahan was divided into three areas based on cultural, social and economic status. The health centres of these different areas were then selected randomly. An equal number of samples were taken from each center in a simple random manner.

We used a questionnaire based on theory of planned behaviour for data gathering, which was divided into 9 sections. The first part was demographic questions that included the mother's age, parents' education level, parents' occupation, income level, number and gender of previous children, possible method of delivery and unwanted or planned delivery. Subsequent sections included questions on TPB. 13 behavioural belief questions about women's opinions of EBF Behaviour (e.g. if I breastfeed my baby for up to six months, he/she will be less likely to develop conditions such as diarrhoea), 10 outcome assessment questions about the importance of results of this behaviour (e.g. it is vital for me that my baby is immune to diseases), 5 questions on normative beliefs about close people's opinion of

this behaviour (e.g. my spouse believes that I should feed my baby with both breast milk and formula before six months), 5 motivational questions to follow the opinion of close people in life (e.g. I will use formula in addition to my own milk to feed my child before six months according to my spouse), 4 questions of controlling beliefs about the individual's perspective on controlling behavioural conditions (e.g. breastfeeding my baby in public is difficult for me), 5 questions of perceived power to perform behaviour despite difficult circumstances (e.g. even if I have a lot of daily chores, I will still only breastfeed my baby for the first six months). Finally, there were 5 behavioural yes/no questions (I use my milk for my baby). The answer to all questions, except behavioural, could be one of five options: completely agree, agree, disagree, disagree and strongly disagree, with a score of 1–5. Content validity was evaluated using the qualitative method and the opinions of 8 experts and experts in the field of health education and health promotion, including pediatricians and epidemiologists [24].

The link to the online questionnaire was sent by the midwife of comprehensive health centres in WhatsApp groups to the sample people. Qualitative and quantitative content validity was carried out taking into consideration of the opinions of 8 experts (in health education and health promotion, including a paediatrician and epidemiologist). Participants completed the research questionnaire (ethics code IR.MUI.RESEARCH.REC.1400.005) when their consent was obtained. The data was analysed using SPSS25 software and descriptive and analytical statistics, including mean, standard deviation, confidence interval, Pearson correlation coefficient test, analysis of variance and multiple linear regression.

## Ethics approval and consent to participate

The objectives of the research was explained to the participants, and they signed informed consent forms. The participants participated in the study voluntarily, and they could leave the research anytime. They were also assured about the secrecy of their information and their knowledge of the results of the study. Isfahan University of Medical Sciences confirmed this research with the ethics code IR.MUI.RESEARCH.REC.1400.005.

## Results

The number of studied samples was 441 pregnant mothers with a mean age of  $29.82 \pm 5.138$  years. 283 people (64.8%) had an academic education, 129 people (29.5%) had diplomas, and the rest had a bachelor's degree. 368 people (83.6%) were housewives. 230 (54.9%) of the husbands of these women had an academic education, 138 (32.9%) had diplomas, and the rest had a bachelor's degree. Half of the participants' spouses (53.7%) were self-employed, 122 (28%) were employees, and the rest were workers. The income level of the participants was 7 (7.7%) low, 177 moderate (40.1%), 220 good (49.9%), and 10 (2.3%) very good (Table 1).

211 (48.1%) of these mothers were primiparous, and 216 (49.2%) were pregnant with their second child. Half of the non-primiparous mothers had a daughter, and the other half had a son. Only 155 (67.1%) of the women had used exclusive breastfeeding for their previous child up to six months of age. 315 people (72.1%) had planned pregnancies. Out of 340 people (77.6%) who had decided on their delivery method, 237 (63%) chose natural birth (Table 2).

In the present study, the mean scores of constructs of behavioural beliefs, outcome evaluation, normative beliefs, motivation to follow, control beliefs, perceived strength, behavioural intention and behaviour were  $51.46 \pm 7.55$ ,  $46.45 \pm 3.33$ ,  $20.02 \pm 3.63$ ,  $19.24 \pm 4.13$ ,  $12.53 \pm 3.68$ ,  $21.01 \pm 4.03$ ,  $7.87 \pm 1.74$  and  $18.02 \pm 1.09$ .

Based on the results of the Pearson correlation coefficient test, there was a positive and significant relationship between the constructs of behavioural beliefs, outcome evaluation,

**Table 1. Association between demographic variables and the mean score of intention and behaviour in the sample individuals**

Variable		n (per cent)	Mean score (SD) of behaviour	p	Mean score (SD) of intention	p
Mother's education level	less diploma	25 (5.7)	17.86 (1.03)	0.753	8.30 (1.39)	0.362
	diploma	129 (29.5)	18.04 (1.11)		7.92 (1.63)	
	academic	283 (64.8)	18.04 (1.10)		7.79 (1.81)	
Father's education level	less diploma	51 (12.2)	17.86 (0.97)	0.432	8.35 (1.40)	0.055
	diploma	138 (32.9)	17.96 (1.09)		7.95 (1.67)	
	academic	230 (54.9)	18.09 (1.12)		7.71 (1.83)	
Mother's occupation	housewife	368 (83.6)	18.00 (1.08)	0.304	7.92 (1.70)	0.142
	employed	72 (16.4)	18.18 (1.13)		7.58 (1.89)	
Father's occupation	self-employed	234 (53.7)	18.17 (1.04)	0.302	7.70 (1.79)	0.066
	office worker	122 (28)	18.79 (0.96)		8.03 (1.68)	
	worker	80 (18.3)	18.05 (1.17)		8.16 (1.63)	
Income level	low	34 (7.7)	18.07 (1.03)	0.818	8.12 (1.73)	0.605
	moderate	177 (40.1)	18.00 (1.18)		7.94 (1.62)	
	good	220 (49.9)	18.00 (1.03)		7.76 (1.85)	
	very good	10 (2.3)	18.37 (1.30)		8 (1.24)	

**Table 2. Association between other variables and the mean score of intention and behaviour in the sample individuals**

Variables		n (per cent)	Mean score (SD) of intention	p	Mean score (SD) of behaviour	p
Number of children	1	211 (48.1)	7.57 (1.67)	0.000	18.01 (1.06)	0.945
	2	216 (49.2)	8.09 (1.78)		18.02 (1.10)	
	3 and more	12 (2.7)	9.25 (1.05)		17.91 (1.24)	
Gender of the previous child	female	115 (50)	8.30 (1.74)	0.178	18.07 (1.12)	0.584
	male	115 (50)	7.99 (1.78)		17.99 (1.09)	
History of exclusive breastfeeding with previous children	yes	156 (67.1)	8.23 (1.76)	0.114	17.97 (1.08)	0.098
	no	76 (32.9)	7.84 (1.77)		18.25 (1.21)	
Type of pregnancy	unwanted	112 (27.9)	8.20 (1.76)	0.014	17.89 (1.13)	0.167
	planned	315 (72.1)	7.74 (1.72)		18.08 (1.07)	
Decision of type of delivery	yes	340 (77.6)	8.02 (1.71)	0.000	18.00 (1.08)	0.459
	no	98 (22.4)	7.30 (1.72)		18.12 (1.17)	
Possible method of delivery	vaginal	237 (63)	7.93 (1.63)	0.928	17.95 (1.03)	0.287
	caesarean section	139 (37)	7.94 (1.88)		18.10 (1.20)	

**Table 3. Pearson correlation coefficient of TPB constructs in the sample individuals**

Variables	1	2	3	4	5	6	7
1. Behavioural beliefs							
2. Outcome evaluation	0.28						
3. Normative beliefs	0.60	0.25					
4. Motivation to follow	0.59	0.25	0.74				
5. Control beliefs	0.24	-0.33	0.18	0.18			
6. Perceived strength	0.58	0.27	0.56	0.65	0.31		
7. Behavioural intention	0.57	0.14	0.54	0.60	0.29	0.68	
8. Behaviour	-0.39	0.00	-0.36	-0.37	-0.30	-0.44	-0.48

normative beliefs, motivation to follow, control beliefs and perceived power with the intention of exclusive feeding of the child, while there was an inverse relationship between these and behaviour (Table 3). According to Table 1, none of the demographic variables had a significant relationship with behavioural intention ( $p > 0.05$ ). However, there was a significant relationship between the number of children and the type of pregnancy and the decision for the type of delivery with the intention of exclusive breastfeeding behaviour ( $p < 0.05$ ) (Table 2).

To examine the predictors of EBF intention in mothers, variables like the number of children, planned or unplanned pregnancy, decision for the type of delivery and all structures of TPB that have a significant relationship with intention were entered into the regression model step by step. Finally, according to Table 5, the variables of behavioural beliefs, outcome evaluation, control beliefs and intention were selected as the most critical structures for predicting behaviour. According to this model,

29.1% of changes in exclusive breastfeeding behaviour with these structures are also predicted.

## Discussion

Our research aimed to examine the exclusive breastfeeding practices in pregnant women who had been referred to comprehensive health service centres in Isfahan after more than 20 weeks of pregnancy. In order to do this, the theory of planned behaviour was used as one of the models for predicting human behaviour [21, 25].

In this study, a significant relationship between the variable of the number of children and the intention of exclusive breastfeeding behaviour was determined. In this regard, Kitano's et al. study found a significant and positive relationship between the number of deliveries and the onset and duration of breastfeeding [26].

Variables	Mean $\pm$ SD	Range of variations
Behavioural beliefs	51.46 $\pm$ 7.55	24–65
Outcome evaluation	46.45 $\pm$ 3.33	36–50
Normative beliefs	20.02 $\pm$ 3.63	9–25
Motivation to follow	19.24 $\pm$ 4.13	7–25
Control beliefs	12.53 $\pm$ 3.68	4–20
Perceived strength	21.01 $\pm$ 4.03	5–25
Behavioural intention	7.87 $\pm$ 1.74	2–10
Behaviour	18.02 $\pm$ 1.09	17–21

	Coefficient	Unstandardised	t	p
	B	Std. Error		
Constant	19.550	0.802	24.376	0.000
Behavioural beliefs	-0.032	0.009	-3.454	0.001
Outcome evaluation	0.050	0.018	2.843	0.005
Control beliefs	-0.035	0.016	-2.182	0.030
Behavioural intention	-0.215	0.039	-0.343	0.000
R Square: 0.291				

If there are more children, the mean EBF intention score will be higher. This indicates the more experience and awareness of multiparous mothers of the ease and importance of this behaviour.

Higher behavioural intention was reported in women who decided to have a normal delivery or caesarean section. In the study of Bajoulvand et al., EBF behaviour was reported more after a caesarean section, while in another study, those who had a normal delivery exhibited this behaviour longer [27, 28]. In natural birth, the mother's body produces hormones to increase the endurance of labour pain and stimulates the adrenal glands of the foetus to increase the production of catecholamines. The production of the hormone oxytocin in the mother's body also activates the milk production reflex. On this account, women undergoing a caesarean section have later milk production and more breastfeeding problems [29]. Therefore, mothers who were aware of these cases and chose their type of delivery had more intention of exclusive feeding.

In contrast with most of the previous studies, the results of this study showed more intention for mothers with unwanted pregnancies [21, 30]. One study stated that a woman's intention to have a child determines the duration of breastfeeding and a man's intention determines to perform or not perform the exclusive breastfeeding behavior [31]. Planning for pregnancy requires parents' mental and physical preparation, especially women, which leads to a greater desire to breastfeed. A possible explanation for this discrepancy among studies could be due to the small number of unwanted pregnancies compared to planned pregnancies and the difference between the individual and family circumstances of the sample.

However, the analysis did not identify any significant association between demographic and pregnancy-related variables in the present study and EBF behaviour. Similar to this study, a lack of relationship between behaviour and maternal age, type of delivery, number of children [32], occupation of parents [33, 34] and family income [27] was reported in other studies.

In contrast to some studies [33, 35–38], the results of this study regarding the lack of relationship between behaviour and maternal education level were consistent with the results of the study by Naserpoor et al. and Heydarpour et al. [34, 39]. While this study found no link between EBF and maternal education, some studies have shown that higher educated mothers are more likely to receive reliable information on breastfeeding and

having greater self-efficacy for breastfeeding behaviour. In others, higher educated mothers had less breastfeeding behaviour because of the possibility of more employment and being away from children.

There has been some disagreement regarding the relationship between breastfeeding and maternal age. In one study, increasing maternal age had a significant and positive relationship with the intention to exclusive breastfeeding [21]. In another study, maternal age had a significant and inverse relationship with breastfeeding behaviour [10], and in yet another study, it had a significant and positive relationship with behaviour [40, 41]. No association was found in this study.

In contrast to this study, in the study of Ogbeide et al., the father's education level and age affected EBF behaviour [42]. However, according to studies number 43, 44, the implementation of an educational programme aimed at increasing the awareness and attitude of the father about exclusive breastfeeding for up to six months can increase the likelihood of this behaviour in the pregnant mother by sharing information and providing motivation and support [43, 44].

Contrary to the present study, in a study by Saeedi et al., a significant relationship was found between previous breastfeeding history and behavioural intention [21]. This discrepancy could be due to the difference in the number of people who had more children.

In addition, previous studies have shown that employed mothers had less breastfeeding behaviour due to distance from the baby, lack of workplace support to facilitate breastfeeding and family support and lack of knowledge about how to properly store and use breast milk for separation times [27, 45]. It is possible that no connection was found because only 16.4% of the sample were employed.

Family income is associated with EBF behaviour, affecting maternal nutritional status before and during pregnancy [46]. The contrast between this result and the present study may be due to cultural and economic differences.

Several previous studies have found a significant relationship between EBF behaviour and child gender. A study conducted in Bushehr showed higher EBF behaviour in female infants, and a similar study in Khorramabad showed more exclusive behaviour in male infants, which is influenced by the cultural differences in a country [27, 30]. Outside Iran, according to cul-

ture, some mothers who do not breastfeed their babies for the first six months and start complementary feeding early believe that they can make the baby healthier and stronger [47]. In this study, no relationship between the gender of the previous child and the intention and behaviour of EBF was observed. Considering that the previous children of multiparous people were relatively equal in terms of girls and boys and the history of EBF being higher in girls, this shows similarities with the study by Jamehei et al. [30]. However, due to diverse circumstances, this conclusion can not be attributed to the pregnancies of the women in this study.

The results of this study revealed that EBF behaviour had a positive and significant relationship with behavioural beliefs, outcome evaluation, control beliefs and intention. Behavioural beliefs and outcome assessment are collectively the structure of attitude, which increases the mean score of behavioural intention and EBF behaviour up until six months. Of course, changing people's attitudes to increasing breastfeeding behaviour requires long-term training programmes [24]. Attitude structure was unrelated to behaviour in the study of Charkazi et al.; however, it was related to behavioural intention in the study of Saeedi et al. [21, 32].

In the present study, control beliefs as part of the structure of perceived behaviour control had a significant relationship with intention and behaviour, which was consistent with the study of Saeedi et al. [21]. It is also recommended that educational interventions focus more on increasing pregnant mothers' confidence in breastfeeding in order to perpetuate this behaviour [48]. In the study of Bajoulvand et al., the perceived power structure was recognised as the best predictor of exclusive breastfeeding behaviour intention due to the research time during the breastfeeding period [27]. Although the support of family members, friends and healthcare personnel leads to an increase in the intention of exclusive breastfeeding behaviour, there was no significant relationship with intention and behaviour in this study [22, 32, 49–51]. Interestingly, according to a study by Fabyi et al., the lack of support from health workers

for EBF by pregnant mothers is more effective in discouraging them than the views of other people [52]. It should be noted that mothers who use only reserved milk to feed their babies do not have the support of others, and to compensate for this, they join groups on social networks for sharing the experiences and information of others, accepting emotional support without fear of being judged and to solving breastfeeding problems [53].

One of the positive points of this study is the selection of pregnant mothers at different stages of pregnancy after 20 weeks, because as the time of delivery approaches, there may be a change in the factors affecting EBF behaviour. Thus, we increased the generalisability of the study results. Completing the questionnaire online and not knowing the personal information of the participants also increased the probability of one answering honestly without fear of being judged.

### Limitations of the study

A limitation of this research is the lack of follow-up of mothers six months after delivery to check whether or not to verify they performed exclusive breastfeeding. It is also recommended that future studies examine the knowledge and attitudes of fathers in this regard.

### Conclusions

In conclusion, considering the essential role of attitude and support in performing exclusive breastfeeding behaviour for up to six months, it has been suggested that effective education should be carried out in this field for adolescent girls and boys.

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**Abbreviations:** Exclusive Breastfeeding – EBF, Theory of Planned Behaviour – TPB.

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### References

- Rahimi T, Dehdari T, Faryabi R, et al. The applicability of the theory of planned-behavior in predicting the intention to exclusive breastfeeding among pregnant women in Qom in 2014. *JRUMS* 2015; 14(4): 299–310.
- Panahi F, Simbar M, Lotfi R, et al. The effect of parents' training on their knowledge, attitudes and performance in exclusive breastfeeding up to four months: A randomized clinical trial. *The Iranian Journal of Obstetrics, Gynecology and Infertility* 2017; 20(5): 48–57.
- Johnson-Young EA. Predicting intentions to breastfeed for three months, six months, and one year using the theory of planned behavior and body satisfaction. *Health Commun* 2019; 34(7): 789–800.
- Yang Y, Wu F, Dwyer T, et al. Associations of Breastfeeding, Maternal Smoking, and Birth Weight with Bone Density and Microarchitecture in Young Adulthood: a 25-Year Birth-Cohort Study. *J Bone Miner Res* 2020; 35(9): 1652–1659.
- Debnath SC, Haque ME, Hasan DM, et al. Undernutrition and morbidity profile of exclusively breastfeeding children: a cross-sectional study. *Int J Prev Med* 2018; 9: 55.
- Barría RM, Santander G, Victoriano T. Factors associated with exclusive breastfeeding at 3 months postpartum in Valdivia, Chile. *J Hum Lact* 2008; 24(4): 439–445.
- Martinez-Brockman JL, Shebl FM, Harari N, et al. An assessment of the social cognitive predictors of exclusive breastfeeding behavior using the Health Action Process Approach. *Soc Sci Med* 2017; 182: 106–116.
- World Health Organization. *Tracking progress for breastfeeding policies and programmes: Global breastfeeding scorecard 2017*. Geneva: WHO; 2017.
- Kamali Z, Rasouli B, Roodpeyma S, et al. Assessment of breastfeeding and related factors in three hospitals of Tehran, 2008. *Iranian J Nutr Sci Food Technol* 2013; 7(5): 125–134.
- Hoseini F, Rasekhi A, Lamyian Myandoab M. Investigating the relationship between exclusive breast-feeding and health literacy in primiparous women. *Daneshvar Medicine: Basic and Clinical Research Journal* 2020; 26(4): 31–36.
- UNICEF. Breastfeeding can save over 1 million lives yearly [cited 07.03.2004]. Available from URL: [https://news.un.org/en/story/2004/07/111032#:~:text=Breastfeeding%20can%20save%20over%201%20million%20lives%20yearly%2C%20UNICEF%20reports,-30%20July%202004&text=If%20more%20infants%20worldwide%20are,Fund%20\(UNICEF\)%20said%20today](https://news.un.org/en/story/2004/07/111032#:~:text=Breastfeeding%20can%20save%20over%201%20million%20lives%20yearly%2C%20UNICEF%20reports,-30%20July%202004&text=If%20more%20infants%20worldwide%20are,Fund%20(UNICEF)%20said%20today).
- Cascone D, Tomassoni D, Napolitano F, et al. Evaluation of knowledge, attitudes, and practices about exclusive breastfeeding among women in Italy. *Int J Environ Res Public Health* 2019; 16(12): 2118.
- Bartle NC, Harvey K. Explaining infant feeding: The role of previous personal and vicarious experience on attitudes, subjective norms, self-efficacy, and breastfeeding outcomes. *Br J Health Psychol* 2017; 22(4): 763–785.

14. Guo JL, Wang TF, Liao JY, et al. Efficacy of the theory of planned behavior in predicting breastfeeding: Meta-analysis and structural equation modeling. *Appl Nurs Res* 2016; 29: 37–42.
15. Zhang Y, Yuan R, Ma R. Effect of the theory of planned behavior on primipara breastfeeding. *Annals of Palliative Medicine* 2021; 10(4): 45–48.
16. Heidari M, Mehri A, Jovini H, et al. Design and psychometric of evaluation tools of effective factors on exclusive breastfeeding in primipara women based on the theory of planned behavior. *Journal of Sabzevar University of Medical Sciences* 2020; 27(2): 183–191.
17. Pakpour Hajiagha A, Saffari M. Predictors of tooth brushing behavior in Iranian Adolescents: an application of the planned behavior theory. *Journal of Islamic Dental Association of Iran* 2012; 24(4): 159–163.
18. Grano C, Fernandes M, Conner M. Predicting intention and maintenance of breastfeeding up to 2-years after birth in primiparous and multiparous women. *Psychol Health* 2022: 1–17.
19. Zhu Y, Zhang Z, Ling Y, et al. Impact of intervention on breastfeeding outcomes and determinants based on theory of planned behavior. *Women Birth* 2017; 30(2): 146–152.
20. Hossain M, Islam A, Kamarul T, et al. Exclusive breastfeeding practice during first six months of an infant's life in Bangladesh: a country based cross-sectional study. *BMC Pediatr* 2018; 18(1): 93.
21. Saeedi M, Shavaki MA, Sarikhani M, et al. Factors affecting pregnant women's intention for exclusive breastfeeding based on the theory of planned behavior. *Health and Development Journal* 2018; 7(2): 142–154.
22. 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. *RJMS* 2015; 21(127): 12–23.
23. Haghani S, Shahnazi H, Hassanzadeh A. Effects of tailored health education program on overweight elementary school students' obesity-related lifestyle: a school-based interventional study. *Oman Medical Journal* 2017; 32(2): 140.
24. Ghaffari M, Rakhshanderou S, Harooni J, et al. Prenatal interventional program about mothers' behavior related to exclusive breast feeding: Findings of planned behavior theory-based research. *J Lifestyle Med* 2019; 9(2): 143–149.
25. Zhang Z, Zhu Y, Zhang L, et al. What factors influence exclusive breastfeeding based on the theory of planned behaviour. *Midwifery* 2018; 62: 177–182.
26. Kitano N, Nomura K, Kido M, et al. Combined effects of maternal age and parity on successful initiation of exclusive breastfeeding. *Prev Med Rep* 2016; 3: 121–126.
27. Bajoulvand R, González-Jiménez E, Imani-Nasab M-H, et al. Predicting exclusive breastfeeding among Iranian mothers: Application of the theory of planned behavior using structural equation modeling. *Iran J Nurs Midwifery Res* 2019; 24(5): 323–329.
28. Yeneabat T, Belachew T, Haile M. Determinants of cessation of exclusive breastfeeding in Ankesha Guagusa Woreda, Awi Zone, North-west Ethiopia: a cross-sectional study. *BMC Pregnancy Childbirth* 2014; 14: 1–12.
29. Kirca N, Adibelli D. Effects of the delivery type on the breastfeeding self-efficacy perception. *Int J Caring Sci* 2020; 13(1): 698.
30. Jamehei F, Ostovar A, Javadzade H. Predictors of exclusive breastfeeding among nulliparous Iranian mothers: Application of the theory of planned behavior. *Int J Pediatr* 2017; 5(3): 4457–4467.
31. Keddem S, Frasso R, Dichter M, et al. The association between pregnancy intention and breastfeeding. *J Hum Lact* 2018; 34(1): 97–105.
32. Charkazi A, Miraeiz SZ, Razzaghejad A, et al. Breastfeeding status during the first two years of infants' life and its risk factors based on BASNEF model structures in Isfahan. *J Educ Health Promot* 2013; 2: 9.
33. Veghari G, Mansourian A, Abdollahi A. Breastfeeding status and some related factors in northern Iran. *Oman Medical Journal* 2011; 26(5): 342.
34. Naserpoor F, Noughaj S, Sharifat R. The pattern of exclusive breastfeeding and related factors in children referred to health centers of Omidieh city in 2010. *Jentashapir Journal of Cellular and Molecular Biology (Jentashapir Journal Of Health Research)* 2011; 2(3(4)): 118–124.
35. Patil S, Ameya H, Pathare S, et al. Prevalence of Exclusive Breast Feeding and its Correlates in an Urban Slum in Western India. *Int J Sci Med Educ* 2009; 3(2): 14–18.
36. Ghanbarnejad A, Abedini S, Taqipoor L. Exclusive breastfeeding and its related factors among infants in Bandar Abbas city, Iran. *J Babol Univ Med Sci* 2014; 16(1): 85–91.
37. Laksono AD, Wulandari RD, Ibad M, et al. The effects of mother's education on achieving exclusive breastfeeding in Indonesia. *BMC Public Health* 2021; 21(1): 1–6.
38. Hamze L, Mao J, Reifsnider E. Knowledge and attitudes towards breastfeeding practices: a cross-sectional survey of postnatal mothers in China. *Midwifery* 2019; 74: 68–75.
39. Heydarpour S, Golboni F, Heydarpour F, et al. Factors associated with exclusive breastfeeding in Kermanshah in 2007. *Behood Journal* 2011; 15(3): 227–230.
40. Jasny E, Amor H, Baali A. Mothers' knowledge and intentions of breastfeeding in Marrakech, Morocco. *Archives de Pédiatrie* 2019; 26(5): 285–289.
41. Mundagowa PT, Chadambuka EM, Chimberengwa PT, et al. Determinants of exclusive breastfeeding among mothers of infants aged 6 to 12 months in Gwanda District, Zimbabwe. *Int Breastfeed J* 2019; 14(1): 1–8.
42. Ogbeide DO, Siddiqui S, Al Khalifa SM, et al. Breast feeding in a Saudi Arabian community. Profile of parents and influencing factors. *Saudi Medical Journal* 2004; 25(5): 580–584.
43. Ouyang YQ, Nasrin L. Father's Knowledge, Attitude and Support to Mother's Exclusive Breastfeeding Practices in Bangladesh: A Multi-Group Structural Equations Model Analysis. *Healthcare (Basel)* 2021; 9(3): 276.
44. Ajike SO, Ogunsanmi OO, Chinenye-Julius AE, et al. Effect of a breastfeeding educational programme on fathers' intention to support exclusive breastfeeding: a quasi-experimental study. *African Journal of Reproductive Health* 2020; 24(3): 59–68.
45. Gebrekidan K, Fooladi E, Plummer V, et al. Enablers and barriers of exclusive breastfeeding among employed women in low and lower middle-income countries. *Sex Reprod Healthc* 2020; 25: 100514.
46. Shofiya D, Sumarmi S, Ahmed F. Nutritional status, family income and early breastfeeding initiation as determinants to successful exclusive breastfeeding. *J Public Health Res* 2020; 9(2): 1814.
47. Dukuzumuremyi JPC, Acheampong K, Abesig J, et al. Knowledge, attitude, and practice of exclusive breastfeeding among mothers in East Africa: a systematic review. *International Breastfeeding Journal* 2020; 15(1): 1–17.
48. Ertem IO, Votto N, Leventhal JM. The timing and predictors of the early termination of breastfeeding. *Pediatrics* 2001; 107(3): 543–548.
49. Supriyanto ALD, Kristianti S, Suwoyo S. Hubungan Dukungan Keluarga Dengan Pola Pemberian Asi Pada Bayi Usia 0-6 Bulan. *Jurnal Pendidikan Kesehatan (e-Journal)* 2021; 10(1): 85–100 (in Indonesian).
50. Scott JA, Landers MC, Hughes RM, et al. Psychosocial factors associated with the abandonment of breastfeeding prior to hospital discharge. *J Hum Lact* 2001; 17(1): 24–30.
51. Brown A, Raynor P, Lee M. Young mothers who choose to breast feed: the importance of being part of a supportive breast-feeding community. *Midwifery* 2011; 27(1): 53–59.

52. Fabiyi CA, Rankin K, Handler A. Association Between Breastfeeding Discouragement and Breastfeeding Behaviors. *J Obstet Gynecol Neonatal Nurs* 2021; 50(5): 568–582.
53. Clapton-Caputo E, Sweet L, Muller A. A qualitative study of expectations and experiences of women using a social media support group when exclusively expressing breastmilk to feed their infant. *Women and Birth* 2021; 34(4): 370–380.

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