The frequency and factors associated with failure in exclusive breastfeeding in Babol, northern Iran: A cross sectional study

Original Article

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Abstract

Background: The reasons for the failure of exclusive breastfeeding (EBF) in the world are different and it changes over time. The aim of this study was to determine the frequency and causes of failure of EBF in infants in Babol, Iran.

Methods: This cross-sectional study was performed on infants referred to the health care centers affiliated by Babol University of Medical Sciences for 6-month age vaccination. Inclusion criteria were parental satisfaction, 6-month infant and lack of infant's congenital anomalies. Mother and infant's demographic information and breastfeeding outcomes were completed by mother's self-declaration. Descriptive and analytical indicators were used for data analysis.

Results: Totally, 371 infants with the mean birth weight of 3265.82±514.19 g were entered into this study. Most of them (72.2%) used at least one of the following cases: pacifier, bottle, sugar water or complementary feeding during the first 6 months of life. According to these results, the rate of failure in EBF was 72.2%. Based on the 4-option question on exclusive breastfeeding, 63.6% of infants had exclusively breastfed. Regression analysis was shown that the maternal age (p=0.012) and gestational age at birth (p=0.039) were predictors of EBF discontinuation.

Conclusions: In this study, the rate of failure in EFB was 72.2%. The lack of awareness of mothers was most common cause of failure in EBF. Moreover, the maternal age and gestational age at birth were effective factors of EBF. The EBF can be improved by planning in educating and supporting mothers, especially in cases where there is preterm delivery.

Keywords: Breast feeding, Failure, Exclusive, Infant, Pacifiers

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Introduction

Breast milk is the gold standard of nutrition for the growth and development of infants [1], and it has a unique biological and emotional impact on the health of mother and baby [2]. Breast milk is most effective in promoting health and preventing many disorders and diseases in children, including bacterial meningitis, otitis media, urinary tract infection, cardiovascular disease [3], diabetes [4], asthma [5] obesity in later life and various cancers [6, 7]. Breastfeeding has also economically and socially benefits for the family and health care system [8, 9]. The World Health Organization (WHO) states that breastfeeding alone without adding any water or food other than vitamins from birth to the end of 6 months of age (EBF) is the most desirable type of nutrition [10]. The reported prevalence of exclusive breastfeeding (EBF) has been different in

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developed and developing countries. For example in developed countries, this rate was reported 16% in the United States [11], 31.4% in Spain [12] and 13.8% in Canada [13]. In developing countries, this rate was reported in Turkey 38.9% [14], Egypt 9.7% [15], Tanzania 20.7% [16] and India 34% [17]. The frequency of the EBF in Iran in a meta-analysis of 62,071 infants in 32 studies was reported to be 52% [18]. The causes of EBF failure vary from country to country. Sari Laanterä reported in a qualitative review of 40 studies that the most important cause of failure of EBF was the lack of maternal awareness [19]. Other causes include the use of pacifiers, infant disease [20], failure to start breastfeeding immediately after delivery [21], mother's employment [21, 22], type of delivery [20] mother's age over 35 years, knowledge of breastfeeding [20, 22], lack of support from family, higher mother's literacy [22] and idea of insufficient breast milk [23]. The causes of EBF failure change over time.

As mentioned earlier, the causes of failure in EBF vary in different parts of the world as well as in different times. With periodic evaluations in each area, health care providers can be helped to find out the causes of EBF failure with the right planning. In addition, they can provide better conditions for mothers to succeed in breastfeeding. On the other hand, in recent years, studies related to the causes of failure in EFB were limited in our region. Therefore, the aim of the present study was conducted to determine frequency and factors associated with failure in EBF in this region of the north of Iran.

Methods

Type of study

This cross-sectional descriptive study was performed from November 2019 to February 2020.

Sampling

All 6-month infants referred for vaccination to the health care centers affiliated by Babol University of Medical Sciences were included in this study. According to the prevalence of failure in EBF in previous studies about 50% (18), 95% confidence level and 5% error (d), the sample size was estimated 380 infant. Sampling was done via census method. Inclusion criteria were parental satisfaction, 6-month infant and absence of congenital anomaly of the infant.

Data collection

A questionnaire was completed by trained employee through interviews with mothers. It included mother and infant's demographic information and lactation results. In demographic and reproductive information, the mother's age, level of education, occupation, place of residence, method of delivery, pregnancy rank and breast problems were assessed. Infant information included gender, weight at time of referring, gestational age at birth and history of hospitalization (cause and duration).

The results of breastfeeding were evaluated by the frequency and factors associated with failure in EBF. A 4-option question was asked of the mother regarding infant nutrition: which of the following methods is your child fed?

- Breastfeeding only
- formula feeding only
- Relative formula feeding (uses formula for 1 to 2 times in 24 hours)
- Relative breastfeeding (uses formula for 3 times and more in 24 hours)

In the next step, mothers were also asked about the use of pacifiers, bottles, sugar water and infant complementary feeding. Questions about breastfeeding outcomes were designed from multiple articles (23), and their content was validated by researchers (A number of faculty members of the Pediatric Research Center).

Statistical data analysis

The data were analyzed using SPSS 16.0, and the continuous variables were evaluated using mean and standard deviation values as well as categorical variables with counts (percentages). Logistic regression analysis was done to determine the predictors of variables (mother and infants' demographic information, midwifery and medical history) to stop the EBF in infants.

Results

In the ongoing study, 371 infants (51.5% girls and 48.5% boys) with the mean birth weight of 3265.514 ± 82.19 gr were included. About 13% of infants were preterm (< 37 weeks of gestation). Moreover, 21.3 % of infant had a history of hospitalization in the first 6 months of life due to the neonatal jaundice, prematurity or respiratory problems (Table 1).

The mean age of mothers was 30.13± 5.29 years, and most of them were educated (58%) and housewives (78%). Nearly, half of them (49.6%) had one child and 70% of them experienced cesarean delivery. Most of mothers (84.1%) received breastfeeding training from health center staff or hospital midwives (Table 2).

Overall, 72.2% of infants were not exclusively breastfed, and they used pacifiers (36.4%), bottles (46.9%), sugar water (28.3%) and complementary feeding (53.6%). According to these results, the rate of failure in EBF was 27.8 % in the current study.

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However, according to the 4-option EBF questions, 63.6% of the infants in the present study were breastfed (not exclusively) and 10.5% of them were exclusively formula fed. The most common reason for stopping EBF in preterm infants was the feeling of insufficient breastfeeding (40%) and infant's illness (22.7%), respectively. In addition, the most common reason for failure in EBF with history of hospitalization was the feeling of insufficient breastfeeding (48%). Logistic regression analysis illustrated that the maternal age (p=0.012) and gestational age at birth (p=0.039) was the predictors of stopping EBF in infants among demographic variables, midwifery variables as well as infant's demographic and medicine variables (Table 3).

Table 1. Characteristics of participants

Variables		N	%	Total
Mother age (Year)	≤25	59	19.6	311
	26-34	175	58.1	
	≥35	67	18.1	
Educational level	Incomplete secondary	26	7.0	371
	Diploma	131	35.3	
	Bachelor's	214	57.7	
Mother jab	Household	302	81.4	371
	worker	69	18.6	
Method Delivery	Vaginal Delivery	116	31.3	371
	Cesarean	255	68.7	
Number of parities	1	184	49.6	371
	≥2	187	50.4	
Pregnancy age	<37	48	12.9	371
	≥37	323	87.1	
Hospitalization of the infant	Yes	79	21.3	371
	No	292	78.7	
Get breastfeeding training	Yes	312	84.1	367
	No	55	14.8	

Table 2. Frequency of exclusive breast feeding

Variables		N	%	Total
Breastfeeding outcomes [a]	Breastfeeding only	236	63.6	371
	Formula feeding only	39	10.7	
	Relative formula feeding (uses formula for 1 to 2 times in 24 hours)	74	19.9	
	Relative breastfeeding (uses formula for 3 times and more in 24 hours)	22	5.9	
Breastfeeding outcomes [b]	pacifier	135	36.4	371
	bottle	174	46.9	
	sugar water	105	28.3	
	complementary feeding	199	53.6	

Breastfeeding outcomes a: bases on 4-options question about exclusive breastfeeding from mothers
Breastfeeding outcomes b: bases on use of pacifier, bottle, sugar water or complementary feeding

Table 3. Regression coefficients of variables predicting the failure of exclusive breastfeeding

Variables	Model 1			Model 2		
	B	SE	P-Value	B	SE	P-Value
Mother age (Year) (≥35/<35)	2.27	0.28	0.005	2.11		0.012
Mother jab (worker/ Household)	1.87	0.27	0.024	1.66		0.11
Educational level (Diploma, Incomplete secondary/ Bachelor's)	1.48	0.39	0.06	1.27		0.33
Method delivery (Cesarean/ Vaginal Delivery)	1.17	0.22	0.46			
Pregnancy age (<37/≥37)	1.93	0.32	0.042	2.22	0.79	0.039
Number of parities (1/≥2)	1.40	0.20	0.1			
Sex (Boy/ Girl)	1.18	0.20	0.41			
Hospitalization of the infant (Yes/No)	2.12	0.26	0.005	1.47	0.20	0.30
Get breastfeeding training (Yes/No)	1.40	0.29	0.25			

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Discussion

According to the results of the present study, the frequency of failure in EBF in the 6-month-old infant population of this region of Iran was 72.2%. This rate is low compared to those found in countries such as Canada and the United States [11, 13] and higher than those in European countries such as Spain [12]. According to a study in Turkey whose culture and religious teachings are like those in Iran, the frequency of EBF was 61.2 % [14]. In a meta-analysis by Behzadifar et al. in Iran, this rate was 48%, [18] which was lower than that in the present study. In justification, it could be said that this figure was related to that in studies published during the years 2003-2015. It seems that the economic situation, political conditions and changes in social and cultural conditions affected by technological advances influence on these numbers. On the other hand, it is important to note that the EBF questions used in various studies are different. Besides, the results of the ongoing study suggested that about two-thirds of infants used at least one of pacifiers, bottles, sugar water and complementary feeding. The frequency of EBF was 63.6% based on the opinion of mothers; however, this rate was reduced to 27.8% according to the standard definition of EBF. It could be inferred that the mothers in the present study had no good knowledge about EBF. Inappropriate awareness of mothers about the importance of EBF has also been reported in Laantera and Mosquer's studies [19, 20]. Furthermore, in a qualitative review of 40 studies, the most important reason for the failure of EBF was the lack of awareness of mothers [19].

The mothers need correct information, calmness and confidence as well as acquire necessary skills to successfully breastfeed and continue it. In the ongoing study, 84.1% of mothers received breastfeeding education, and there was no significant difference in EBF of infants with mothers who did not receive training. It seems that teaching methods of EBF should be reconsidered by health care providers. In particular, special attention should be paid to the causes of EBF failure.

The results of univariate linear regression analysis displayed that after adjustment with intervening variables, the maternal age (more than 35 years) and gestational age at birth (less than 37 weeks) were significantly effective in stopping breastfeeding. Similar to the present study, in the studies of Mosquera and Lestari, the maternal age >35 was also one of the reasons for EBF failure [20, 22]. Probably, the reason for the decrease in breastfeeding at older ages is an unfavorable attitude in mothers or unwanted pregnancies in women >35, which can affect the success of breastfeeding, certainly, in a separate study, the possible reasons should be considered. The gestational age of the baby at birth (<37 weeks) was also a factor that was significantly effective in stopping breastfeeding because the nutritional problems are more common in premature than in term infants, such as fatigue during feeding and excessive irritability, longer sleep time, incoordination between swallowing, sucking, and breathing in infants <34 week [5]. This study had some limitations: the study was performed by cross-sectional design at 6 months of infants' age. Cohort study at different stages (2, 4 and 6 months) of breastfeeding can demonstrate reliable information on the reasons for EBF failure. In addition, this study was performed on urban infants. Moreover, assessment of rural infants can provide carefully information about reasons for breastfeeding failure.

In this study, the rate of EFB failure was 72.2 %. The most common cause of EBF failure was the use of pacifier, bottle and sugar water, which was due to the lack of awareness of mothers. Further, the maternal and gestational ages at birth were effective factors of EBF failure. The EBF can be improved by planning in educating and supporting mothers, especially in cases where there is preterm delivery.

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