

The association of the duration of exclusive breastfeeding up to 6 months with multipara mothers in Semarang, Central Java, Indonesia

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Abstract

Background: The practice of breastfeeding is very much influenced by many factors, meaning that it cannot be done by all mothers, whether it is caused by infant or maternal factors. **Aim:** To assess the factors associated with the duration of exclusive breastfeeding practice. **Settings and Design:** This cohort study was carried out in Kedungmundu District, Semarang City, Central Java Province, Indonesia. 36 breastfeeding mothers were followed after delivery until the end of their exclusive breastfeeding (EBF) practice. **Methods and Material:** The general characteristics of mothers and infants were obtained using structured interviews. Body weight, height, and mid-upper arm circumference (MUAC) were assessed for the profile of the maternal nutritional status. **Statistical analysis:** Multivariate analysis was used to determine significant predictors of EBF duration. **Results:** The EBF practice decreased steeply from the beginning of infant's life to 6 months of age. About 58.3% of infants were not exclusively breastfed in their first month. Only 25% of them were breastfed successfully until 6 months. More than half of the mothers were multipara (58.3%), 55.6% lived in nuclear family, 22.2% were underweight before pregnancy, and 16.7% were protein-energy malnourished at baseline of survey. Infant's sex, parity, mother's nutritional status before pregnancy and after delivery were factors that were included into multivariate analysis. It showed that being multipara was associated with the duration of EBF practice up to 4 months ($p=0.026$,

OR=40.51), as well as at 6 months ($p=0.045$, OR=17.08). **Conclusion:** Being a multipara mother consistently provides EBF success benefits for up to 4 months and 6 months.

Keywords: Exclusive breastfeeding, duration, multipara, Semarang

Key Messages:

Exclusive breastfeeding practice is directly influenced by infant and maternal factors. The nutritional status of the mother before pregnancy and during breastfeeding is also used as predictor. Among these factors, the most helpful in the practice of exclusive breastfeeding for 6 months is the breastfeeding experience that multiparous mothers have.

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Introduction

Increasing the practice of exclusive breastfeeding for infants aged 0-6 months is included in the First 1000 Days of Child Life program. This program is implemented in all over the world, including in Indonesia. Benefits of exclusive breastfeeding for infant health have been found in various studies, such as prevention of infectious diseases, i.e. diarrhea, acute respiratory disease,^{[1], [2]} otitis media^[3] etc. For mothers, exclusive breastfeeding can help control pregnancy spacing, reduce the risk of epithelial ovarian cancer^[4] and prevent postmenopausal metabolic syndrome.^[5] Breastfeeding in Indonesia is a common practice. In 2019, the practice of exclusive breastfeeding could reach 68.74% nationally, exceeding the target set by the government.^[6] However, the practice of exclusive breastfeeding is unsuccessful for some mothers. It is influenced by many factors. Indonesian Basic Health Research in 2018 noted that the dominant factors which caused breastfeeding failure were breast milk that did not come out, the infant was far from the mother, the infant could not breastfeed, and others.^[7] The knowledge about breastfeeding, experience of mothers regarding breastfeeding from their previous children,^{[8], [9]} self-efficacy, and support from people around the mother^{[10], [11]} also play a role in mother's negative assumptions about breast milk production. Furthermore, those factors will affect the duration of exclusive breastfeeding practice.^{[8], [12]}

The complexity of factors that play a role in the mother's psychological condition and the mechanism of milk production also affect the ability of mothers to breastfeed. The physiology of breastfeeding is closely related to hormones such as oxytocin and prolactin.^{[13]-[15]} The comfort that the mother feels during breastfeeding affects both of them. The factor that is rarely evaluated is its effect

on the availability of nutrients in the mother's body. In producing breast milk, the mother's body undergoes many processes which are influenced by adequate nutritional intake, absorption and transport, the activity of the mammary glands, and the metabolic pathways of macronutrients from the mother to breast milk.^[16] This circumstance is also related to the nutritional status of the mother during pregnancy, as a nutritional reserve is needed to maintain the mother's nutritional status during breastfeeding.^{[17], [18]} In general, previous studies did not comprehensively consider the role of maternal nutritional status in the mother's internal factors in relation to the success of exclusive breastfeeding practice. Therefore, this study aims to assess the factors that influence the duration of EBF practice the most using infant and maternal factor predictors, in which the role of nutritional status before pregnancy and during breastfeeding is included.

Subjects and Methods

This research was conducted in Kedungmundu Sub-district, Semarang City, Central Java Province, Indonesia. A total of 36 breastfeeding mothers were assessed for their breastfeeding practice beginning from after delivery until their exclusive breastfeeding practice ended. The inclusion criteria for this study were mothers who were still breastfeeding, infant born with normal weight (> 2.5 kg), not twins, healthy or did not experience illness that required special care and no abnormalities that made breastfeeding difficult. At the beginning of the observation, the EBF practice examination was carried out by asking what kind of food or drink that was given when the infant was delivered, starting from the first 3 hours, to the last 24 hours before the interview was conducted. In order to check the exclusivity of breastfeeding practices during the observation, the researchers asked about food or drinks other than breast milk that had been given to their infant during the last few weeks. Mothers who answered that they did not provide any food or drink (including drinking water) to their babies other than breast milk, except for drugs or supplements prescribed by a doctor, were included in the group that practiced EBF.

The general characteristics of mothers and infants were obtained using structured interviews. Maternal nutritional status profiles were obtained through assessments of body weight, height, and mid-upper arm circumference (MUAC). Anthropometric data for mothers before pregnancy were obtained from data recorded in maternal and child health books. The cut offs used to determine underweight mothers based on BMI classification for Asian was $<18.5 \text{ kg/m}^2$.^[19] Mothers were categorized as overweight if the percentage of body fat was $\geq 23 \text{ kg/m}^2$,^[20] while they were categorized as suffering from protein energy malnutrition (PEM) if the MUAC of mothers was $<22 \text{ cm}$.^[21] Univariate analysis was used to describe the characteristics of infants and mothers. Spearman-rank test and chi-square test were used to assess the association between variables with significance level of 0.05.

Multivariate logistic regression analyses were used to determine significant predictors of EBF duration. The predictors that were chosen to be analysed were factors with p values of less than 0.250 or had the potential to become candidate according to previous studies.^[22] This study was approved by Health Research Ethics Commission, Faculty of Public Health, Universitas Diponegoro (SK No. 102/EC/FKM/2015). Participation consents have been obtained from all respondents and are being kept confidential.

Results

The study found that EBF practice decreased sharply from early infancy to 6 months of age (Figure 1). Unfortunately, 58.3% of infants were not exclusively breastfed at the start of the study. Only 35.3% of the rest of the mothers who successfully exclusively breastfed their infant for up to 6 months or in total only 16.7%. Overall, the infants had normal body weight and length at baseline. Likewise, before pregnancy, mothers were generally in good nutritional status, even though after giving birth they were overweight due to fat reserves during pregnancy (Table 1).

Based on the analysis of the relationship at the period of 16 weeks, the associated factor was maternal parity. In this study, the number of first-time mothers was almost half of the total respondents. The tendency that occurred was that mothers with more than 1 child were more likely to practice EBF than new mothers. This condition also occurred when exclusive breastfeeding was maintained until week 24. This study also showed that in the final stages of EBF, factors of maternal nutritional status before pregnancy also played a role. However, the trend that occurred was that mothers with normal body mass index status before pregnancy were not successful in conducting exclusive breastfeeding.

Figure 1. Exclusive breastfeeding practice up to 6 months

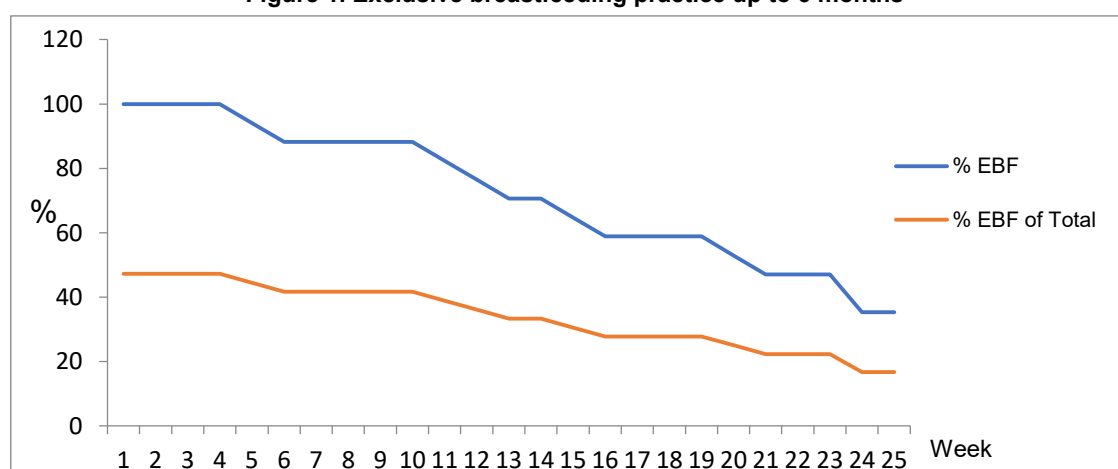


Table 1. General characteristics of infants and breastfeeding mothers and its association with exclusive breastfeeding up to 24 weeks

Variables	Value	p	r
Infant factors			
Median age at baseline (weeks old, min.-max.)	3.0 (1-19)	0.060	-0.317
Birth Length (cm) (median,min-max)	49 (46-53)	0.403	0.144
Birth Weight (g) (mean ± SD)	3100 ± 313.9	0.229	0.205
Maternal factors			
Average age at baseline (years old, mean ± SD)*	28.5 ± 4.6	0.258	0.209
Median parity(children, min.-max.)	2 (1-4)	0.384	0.149
Median number of family member(person, min.-max.)	5 (1-10)	0.028 ^a	0.366
Median family income (IDR, min.-max.)	2,000,000 (500,000-10,000,000)	0.167	-0.235
Median body weight at baseline (kg, min.-max.)	54.3 (39.2-118.5)	0.242	-0.200
Average height (cm, mean ± SD)	154.1 ± 4.9	0.063	-0.313
Median body mass index before pregnancy (kg/m ² , min.-max.)	20.5 (16.4-42.7)	0.484	-0.120
Median body mass index at baseline (kg/m ² , min.-max.)	23.2 (17.4-45.2)	0.307	-0.175
Median MUAC at baseline (cm, min.-max.)	26.3 (21.5-44.0)	0.066	-0.310
Average body fat percentage at baseline (% ,mean ± SD)	29.8 ± 5.7	0.610	-0.315

^aSignificant association, Spearman-rank test

Mothers who lived with their parents were included as candidates in the multivariate analysis based on previous studies; the influence of the extended family of mothers who lived at home could have a negative impact on EBF practice or vice versa (Table 3). Of the predictors included in the analysis, maternal parity status was consistently a significant factor in the success of EBF up to 16 weeks (4 months) and extended to week 24 (6 months). Previous breastfeeding experience made it 17.07 times easier for mothers to maintain exclusive breastfeeding for up to 6 months.

Table 2. Infant and maternal factors associated with duration of exclusive breastfeeding practice up to 16 and 24 weeks

Variables	Value	p value	
		16 weeks	24 weeks
Infant factors			
Sex			
Boy (n, %)	19 (52.8)	0.311	0.255
Girl (n, %)	17 (47.2)		
Maternal factors			
Productive age (n, %)	28 (90.3)	1.000	1.000
Primipara (n, %)	15 (41.7)	0.006 ^a	0.051 ^a
Nuclear family(n, %)	20 (55.6)	0.096	0.700
Family income below regional minimum wage (n, %)	17 (47.2)	0.311	1.000
Underweight before pregnancy (n, %)	8 (22.2)	0.897	0.027 ^b
Underweight at baseline (n, %)	1 (2.8)	0.198	0.098
Overweightat baseline (n, %)	19 (52.8)	0.579	0.176
Protein-Energy Malnourished at baseline (n, %)	6 (16.7)	0.210	0.151

^a Significant association, chi-square test, ^b Significant association, Fisher's exact test

Table 3. Factors associated with duration of exclusive breastfeeding practice up to 16 and 24 weeks

Variables	Until 16 weeks*			Until 24 weeks**		
	β	p	OR	β	p	OR
Multipara mother	3.701	0.026	40.506	2.838	0.045	17.075
Live in extended family	1.219	0.395	3.385	-	-	-
Good nutritional status before pregnancy	-	-	-	-0.118	0.926	0.889
Normal MUAC after delivery	-0.233	0.112	0.792	-2.009	0.213	0.134
Normal body fat percentage after delivery	-	-	-	0.699	0.427	2.013
Having girl infants	-	-	-	1.475	0.221	4.370
	-1.974	0.660	0.139	-6.185	0.131	0.002

^a Significant association, * correct prediction: 66.7%, ** correct prediction: 80.6%

Discussion

The practice of breastfeeding is common among mothers in the Asian region because of the culture that supports this practice. But it is difficult to maintain exclusive breastfeeding for up to 6 months as recommended by WHO. Breastfeeding in urban and rural areas shows different circumstances even though they are in the same culture. This study was conducted in a suburban area of Semarang. It shows that the practice of EBF is also difficult for 1 in 2 mothers who give birth to their infant.

Although many studies have revealed the factors that cause mothers to be unable to perform EBF in different locations and countries, the causative factors are very dynamic and vary as the time goes on. A systematic review of studies in Iran revealed that the practice of breastfeeding was widely practiced by mothers with an average duration of breastfeeding of up to 17.31 months. However, younger mothers and mothers with higher levels of education were more likely to stop breastfeeding earlier.^[12] In Japan, multiparous mothers, who are married and do not work are more likely to carry out EBF. A study found that primiparous mothers had higher scores of anger and rejection than multiparous mothers.^[8] In contrast, a study in the United States found that primiparous mothers were more likely to breastfeed than multiparous, but nevertheless had a shorter breastfeeding duration than multiparous mothers.^[9] In the context of mothers in Indonesia, these findings may be similar in several ways. Being multiparous might help the mother to manage lactation problems (coping strategies) and improve their self-efficacy based on their experience in taking care of their first child.

The number of children can affect the mother's breastfeeding experience, but another thing that makes multiparous mothers successful is that it is also influenced by the mother's nutritional status during breastfeeding. This is also related to milk production and mothers' perceptions of the adequacy of their milk production. Studies in Turkey found that in addition to maternal demographic factors including parity, gaining knowledge about breastfeeding could influence the mothers' self-efficacy and perceptions of breast milk adequacy.^[23] A research also showed that mothers with good nutritional

status could practice breastfeeding more easily, especially exclusive breastfeeding.^[17] Previous studies have found that EBF practices can reduce the percentage of fat and tend to lower the body mass index of mothers compared to those who do not do EBF.^{[24], [25]}

Basically, the nutritional status of the mother during breastfeeding is the utilization of nutritional reserves that have been saved during pregnancy.^{[13], [26]} The factor of maternal experience balanced with the adequacy of the mother's nutritional status greatly influence both the adequacy of breast milk and the mother's confidence to be able to maintain the practice of EBF for up to 6 months. This study tries to see together the effects of the factors that have been investigated by previous studies plus the factor of maternal nutritional fulfilment starting from before pregnancy and during breastfeeding. However, based on statistical tests, the more influential factor of exclusive breastfeeding practice up to 4 as well as 6 months is parity. It is necessary to carry out further research with a larger number of subjects and to include other factors that may also influence it.

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