

# DETERMINANTS OF EXCLUSIVE BREASTFEEDING IN INDONESIA: EVIDENCE FROM THE 2017 INDONESIAN DEMOGRAPHIC HEALTH SURVEY (IDHS)

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**Abstract.** Exclusive breastfeeding is feeding an infant only with mother's milk until he/she is six months old. In 2019, the rate of exclusive breastfeeding practices in Indonesia was 67.74%, however, lower rates than the national target of 50% were found in four provinces of Indonesia. The purpose of this study was to analyze the determinants of exclusive breastfeeding among children aged under six months in Indonesia. A cross-sectional study was conducted using secondary data from 2017 Indonesian Demographic and Health Survey (IDHS). The research independent variables were pre-lacteal feeding, bottle feeding, age, parity, mother's occupation, mother's education, wealth index, and breastfeeding initiation while the dependent variable was exclusive breastfeeding. The sample of this study was 742 children aged under six months. Data were analyzed using the Chi-square test. The results showed that the coverage of exclusive breastfeeding was 87.3%. The chi-square analysis revealed that determinants that significantly hindered exclusive breastfeeding practices among Indonesian mothers were bottle-feeding practices ( $p<0.001$ ), child's age ( $p<0.001$ ), and parity ( $p=0.001$ ). In conclusion, the mother's role is important to improve knowledge about the advantages of exclusive breastfeeding and bottle-feeding practices.

**Keywords:** exclusive breastfeeding, bottle feeding, parity, Indonesia

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## INTRODUCTION

Exclusive breastfeeding is giving breast milk to babies without providing other complementary food, except for vitamins, minerals, and medicines until they are six months old (Republic of Indonesia, 2012). Breast milk is an ideal food for babies because it contains various nutrients and other important substances such as immunoglobulin A (IgA) that can improve child health status in the future (Turin and Ochoa, 2014; Rohmah *et al*, 2015). Exclusive breastfeeding can affect the growth, development and survival of a child as a whole (Barir and Fatmawati, 2020) and reduce the infant mortality rate (IMR) (Noflidaputri, 2021). A previous study showed that exclusive breastfeeding reduced the risk of infant deaths by 13% (WABA, 2014). Besides, it is also useful for helping brain growth and development, boosting the immune system, protecting children from various infectious diseases and other diseases, and even reducing the possibility of cardiovascular health problems. It is beneficial not only for babies, but also mothers. It can increase self-confidence, build an intimate bond between mother and baby, and reduce the risk of breast cancer (Turck *et al*, 2013).

In Indonesia, the importance of the benefits of exclusive breastfeeding has also been regulated in the Indonesian Government Regulation Number 33 of 2012 (Republic of Indonesia, 2012). Based on the results of the Strategic Plan Survey, the coverage of exclusive breastfeeding in Indonesia in 2019 was 67.74% (Indonesian Ministry of Health, 2015) which met the national target, while four provinces, namely Gorontalo Province, Maluku Province, Papua Province, and Papua Barat Province, were reported to have exclusive breastfeeding coverage below the national target. In addition, the 2017 Indonesian Demographic and Health Survey (IDHS) showed that the percentage of exclusive breastfeeding in Indonesia more likely increased from 42% in 2012 to 52% in 2017 (Indonesian Population and Family Planning Agency, 2018; Indonesian Population

and Family Planning Agency, 2013). However, the coverage of exclusive breastfeeding decreased along with the child's age with a coverage of 67% in one-month-old children, 38% at the age of 2-3 months, and 38% at the age of 4-5 months (Indonesian Population and Family Planning Agency, 2018).

The success of exclusive breastfeeding for infants under six months old can be influenced by various factors. A study showed that the most dominant determinants of exclusive breastfeeding are the mother's education level, the child's age, and the family's economic level (Putri and Naim, 2021). In addition, exclusive breastfeeding behavior is also related to the behavioral theory proposed by Lawrence Green (Green and Kreuter, 1991). This theory explains that a person's health behavior can be influenced by various factors, ie, predisposing, supporting, and reinforcing factors. Predisposing factors for exclusive breastfeeding are socio-demographic factors which include parents' education, education level, place of residence, economic level, and age. Meanwhile, supporting factors for exclusive breastfeeding include access to service facilities and health information, places of delivery, and others; forcing factors are support from family, friends, or health workers to mothers, and so on (Notoatmodjo, 2010). Various studies mostly studied only in a certain area or region, so there have not been many studies that have examined the determinants of exclusive breastfeeding with national coverage so that research results can be more representative (Febryanti and Suguartini, 2021; Fauziah *et al*, 2020; Rahmawati and Saputri, 2018). In addition, there are still many studies that examine the determinants of exclusive breastfeeding using secondary data. From the search results conducted by researchers, it was found that there were only 2 studies that used IDHS 2017 secondary data, but in those studies, they did not examine the variables of maternal parity and early initiation of breastfeeding (Putri and Naim, 2021; Suparmi and Saptarini, 2014). Based on the above background, this study was aimed at researching and analyzing the determinants of exclusive breastfeeding from the 2017 IDHS data.

## MATERIALS AND METHODS

This study was a cross-sectional study using secondary data from the 2017 Indonesia Demographic and Health Survey (IDHS). The IDHS has been conducted across provinces of Indonesia since 1987, and the 2017 IDHS is the 8th survey. The 2017 IDHS was carried out from July to September 2017, while data processing was carried out in July 2022. In the 2017 IDHS, a cluster sampling approach was used to select the respondents based on the allocation of specific clusters in rural and urban settlements. This current study involved women of childbearing age to obtain information related to children. The population of this study was the entire survey sample amounting to 17,848 women of childbearing age or mothers who were successfully interviewed and had children under six months old. The sample in this study was obtained from the entire research population, which met the inclusion criteria, after data cleaning. The inclusion criteria were mothers aged 15-49 years who had alive children under six months old and lived in Indonesia. Whereas, the exclusion criteria were respondents that did not answer and complete the questionnaire based on 2017 IDHS data or report. In this study, researchers utilized and analyzed the 2017 IDHS data obtained from DHS official website page, <https://dhsprogram.com>. The authors had obtained an approval letter to access and use data from DHS via email and had received an ethically proper research certificate from The Health Research Ethics Commission, Faculty of Public Health, Airlangga University, Surabaya, Indonesia.

The results showed that 742 samples were eligible for analysis. The dependent variable in this study was exclusive breastfeeding which was classified into two categories, yes or no exclusive breastfeeding. While the independent variables were pre-lacteal feeding, bottle feeding, child's age, parity, mother's occupation, mother's education, wealth index, and breastfeeding initiation.

Child's age can be defined as the life time (years) of the child from birth

to the date that 2017 IDHS was conducted. The child's age variable is based on a study conducted by Putri and Naim (2021) where the categorization is divided into 3, namely 0-1, 2-3, 4-5 months because the older the child, the less a mother will give exclusive breastfeeding. Parity can be defined as the number of children who have been born to mothers which are then divided into 2 categories, namely primipara and multipara. The variable of pre-lacteal feeding can be defined as giving food/drink in the first 3 days to the baby before the milk comes out. The variable category of pre-lacteal feeding was based on whether children under 6 months had received pre-lacteal food or not (Putri and Naim, 2021). Bottle use is defined as a child who in the last 24 hours drank a bottle with a nipple (bottle with nipple). For the bottle-feeding practice variable, it is also based on whether in the last 24 hours, children <6 months old received breast milk through a bottle or not (Putri and Naim, 2021).

The mother's occupation variable can be interpreted as the type of work that the mother had during the last 12 months when IDHS 2017. The mother's education variable can be defined as the last formal education taken by the mother of the toddler. Mother's education level is divided into several categories where the primary category is not ever attending school, elementary school and junior high school, middle is for senior high school, and higher is diploma/bachelor degree and above (Republic of Indonesia, 2008).

The wealth index variable can be interpreted as the level of family welfare based on the number and type of goods owned such as electronic goods, vehicles, house characteristic, and so on (Indonesian Population and Family Planning Agency, 2018). The category used for the family economic level variable is based on the 2017 IDHS itself (Indonesian Population and Family Planning Agency, 2018). In addition, the categories of wealth index levels are determined based on the national wealth quintile that organized based on the household score for each household member, ranking everyone according to their score and dividing them into 5 equal categories or quintiles,

each 20% of the population (Indonesian Population and Family Planning Agency, 2018). The categories that used for family economic level were poorest, poorer, middle, richer, and richest (Indonesian Population and Family Planning Agency, 2018).

Meanwhile, early initiation of breastfeeding is an action taken by the mother by giving breast milk as soon as possible after giving birth. However, the categorization of the type of mother's work is based only on not working and working in accordance with research conducted by Putri and Naim (2021). Likewise, with breast-feeding initiation and mother's parity variables.

Research data processing was done on the Statistical Package for the Social Sciences (SPSS) version 25.0 (IBM Corp, Armonk, NY). The chi-square test was used to analyze the relationship between the independent variables and the dependent variable. Variables with a *p*-value <0.05 were considered statistically significant.

This study was granted an ethical approval by The Health Research Ethics Commission, Faculty of Public Health, Universitas Airlangga, Surabaya, Indonesia on 6 April 2022 with approval number 51/EA/KEPK/2022.

## RESULTS

In this study, as many as 87.3% of 742 children received exclusive breastfeeding. The percentage of exclusive breastfeeding practices in children under six months old can be further seen in Table 1.

In this study, it was found that the majority of children were at the age of 2-3 months (37.7%) followed by the age of 4-5 months (37.1%) and the age of 0-1 month (25%). The findings on mother's education levels showed a high percentage of low education levels (41.4%) followed by secondary education levels (37.5%) and high education levels (21.2%). The detailed about children's age and mother's education levels can be further seen in Table 2.

Table 1  
Coverage of exclusive breastfeeding based on 2017 Indonesian Demographic Health and Survey (IDHS)

Exclusive breastfeeding	Frequency <i>n</i> (%)
No	94 (12.7)
Yes	648 (87.3)
Total	742 (100.0)

Table 2  
Relationships between independent variables and dependent variable based on 2017 Indonesian Demographic Health and Survey (IDHS)

Variable	Exclusive breastfeeding, <i>n</i> (%)			<i>p</i> -value
	No	Yes	Total	
Pre-lacteal feeding				
No	66 (8.9)	465 (62.7)	531 (71.6)	0.756
Yes	28 (3.8)	183 (24.7)	211 (28.4)	
Bottle feeding practice				
No	5 (0.7)	431 (66.5)	436 (58.8)	<0.001*
Yes	88 (11.9)	214 (28.8)	302 (40.7)	
Do not know	1 (0.1)	3 (0.4)	4 (0.5)	
Children's age				
0-1 months old	8 (1.1)	179 (24.1)	187 (25.2)	<0.001*
2-3 months old	38 (5.1)	242 (32.6)	280 (37.7)	
4-5 months old	48 (6.5)	227 (30.6)	275 (37.1)	
Mother's parity				
Primipara	47 (6.3)	206 (27.8)	253 (34.1)	0.001*
Multipara	37 (6.3)	442 (59.6)	489 (65.9)	

Table 2 (cont)

Variable	Exclusive breastfeeding, <i>n</i> (%)			<i>p</i> -value
	No	Yes	Total	
Mother's education <sup>1</sup>				
Primary	39 (5.3)	268 (36.1)	307 (41.4)	0.121
Middle	42 (5.7)	236 (31.8)	278 (37.5)	
Higher	13 (1.8)	144 (19.4)	157 (21.2)	
Mother's occupation				
Not working	57 (7.7)	377 (50.8)	434 (58.5)	0.651
Working	37 (5.0)	271 (36.5)	308 (41.5)	
Family economic level <sup>2</sup> (Wealth index)				
Poorest	20 (2.7)	165 (22.2)	185 (24.9)	0.851
Poorer	19 (2.6)	130 (17.5)	149 (20.1)	
Middle	19 (2.6)	123 (16.6)	142 (19.1)	
Richer	20 (2.7)	113 (15.2)	133 (17.9)	
Richest	16 (2.2)	117 (15.8)	133 (17.9)	
Breastfeeding initiation				
Within one hour	31 (4.2)	217 (29.2)	248 (33.4)	0.922
After one hour	63 (8.5)	431 (58.1)	494 (66.6)	

\*Significance when  $p < 0.05$

<sup>1</sup>Primary: never attend the school to junior high school level; Middle: senior high school; Higher: diploma/bachelor degree and above)

<sup>2</sup>The classifications follow the criteria of Indonesian Population and Family Planning Agency (2018)

In addition, 58.5% of the mothers did not work, 24.9% were at the poorest economic level, 71.6% did give pre-lacteal food to their children, 58.8% did not bottle-feed their children and 66.6% initiated early breastfeeding (IMD) within >1 hour after delivery. From the chi-square test results, this study showed the determinants that had significant relationships with exclusive breastfeeding were bottle use ( $p<0.001$ ), child age ( $p<0.001$ ), and parity ( $p=0.001$ ). The frequency distribution of the independent variables and their relationships are explained further in Table 2.

## DISCUSSION

Until now, various countries have intensified the importance of exclusive breastfeeding for infants up to six months of age since breast milk is the most ideal food that contains various important nutrients for the growth and development of children in the next life (Munirah, 2021). This current study found that the coverage of exclusive breastfeeding in Indonesia based on the 2017 IDHS was 87.3%, higher than that reported in the 2017 IDHS (37.2%) and that in the 2015-2019 Strategic Planning (67.74%) (Indonesian Population and Family Planning, 2018; Indonesian Ministry of Health, 2019; Indonesian Ministry of Health, 2015). Differences in the coverage across the years could be influenced by sampling technique and the time of data collection.

Furthermore, this study showed a significant relationship between the use of bottles and the success of exclusive breastfeeding in children under six months old ( $p<0.001$ ). Research conducted in Sleman Regency, Yogyakarta, found that a similar result (Dwicahyani and Prabandari, 2017). In addition, a research utilizing 2012 IDHS data also confirmed the use of bottle is one of the determinants of exclusive breastfeeding in Indonesia (Suparmi and Saptarini, 2014). Children who were not given breast milk through bottles had 15 times higher chance of getting exclusive breastfeeding compared to children given breast milk through bottles (Lenja *et al*, 2016). Based on the

World Health Organization's (WHO) guidelines, one way to support exclusive breastfeeding is avoiding bottle- or pacifier-milk feeding (WHO, 2017). Mothers who prefer pumping may experience reduced milk production, and their children will experience nipple confusion which will then interfere with the proper exposure to breastfeeding (Anitasari *et al*, 2020).

Moreover, this study also found that child's age was significantly related to the success of exclusive breastfeeding ( $p < 0.001$ ). It is in line with previous research which showed a similar result (Putri and Naim, 2021; Onah *et al*, 2014). In other words, the older the child, the less breastfeeding given. The less frequent breastfeeding in conjunction with child's age may be related to the period of maternity leave among working mothers which normally takes up to three months (Suparmi and Saptarini, 2014). A previous study showed that children aged 0-1 months and 2-3 months had 22.835 times and 5.014 times more chance to get exclusive breastfeeding compared to children aged 4-5 months, respectively (Putri and Naim, 2021).

In this study, maternal parity was also significantly related to the success of exclusive breastfeeding ( $p = 0.001$ ). It conforms with research conducted by Widodo *et al* (2019). This current study showed that most of the mothers were multiparous. Previous research mentioned that multiparous mothers had better breastfeeding behavior, knowledge (Cotelo *et al*, 2018), experience and skills of baby care that affect their commitment and attitude toward exclusive breastfeeding than primiparous mothers (Hamze *et al*, 2018). However, the results of this study contradict a previous study conducted by Istighfarisma *et al* (2021) who did not find the relationship between parity and the success of exclusive breastfeeding.

Meanwhile, other variables, ie, pre-lacteal feeding, mother's education, mother's employment status, family economic level, early breastfeeding initiation did not have significant relationship with the success of exclusive breastfeeding. Pre-lacteal food is food or drinks for newborns in the first few days of life before breast milk comes out (Indonesian Population and Family Planning Agency, 2018). This study showed no significant relationship

between pre-lacteal feeding and the success of exclusive breastfeeding in children under six months old in Indonesia ( $p=0.756$ ). Pre-lacteal feeding is one of the factors that may result in the success or failure of exclusive breastfeeding (Fikawati and Syafiq, 2009). The 2017 IDHS data showed as many as 3% of children received pre-lacteal food among children who ever received breast milk. The results of this study are in line with research conducted in India where infants who received pre-lacteal food had a 60% lower chance of getting exclusive breastfeeding during the last 24 hours compared to infants who were not given pre-lacteal food (Das *et al*, 2019). Pre-lacteal feeding is given mostly based on various reasons, one of which is due to hereditary traditions between families. Pre-lacteal feeding may cause child growth failure, allergic reactions in infants, and mastitis for mothers (Jayarama and Ramaiah, 2017). Research conducted by Pitaloka *et al* (2018) similarly showed that mother's education was not significantly related to exclusive breastfeeding practice. Tang *et al* (2019) found the higher mother's education level, the less the number of mothers breastfeeding their babies. This statement accords with the current finding that most mothers with secondary and higher education levels tended not to exclusively breastfeed their children. Education may be related to the employment status. However, Paschalia (2017) showed this variable was not significantly related to exclusive breastfeeding practice. Working mothers might tend to give complementary feeding too early and formula milk incessantly. Previous research contrarily found no relationship between early breastfeeding initiation and the success of exclusive breastfeeding (Nisrina *et al*, 2019). Other influential variables such as maternal age, mother's knowledge, and family support may affect the results (Sohimah and Lestari, 2018).

This study gave a representative insight about exclusive breastfeeding practices in Indonesia as it used a big data set of the 2017 IDHS. However, the variables studied were limited, and exclusive breastfeeding was only measured from mother's answers to a question whether babies aged 0-5 months were breastfed or not in the last 24 hours. Hence, future research needs to include more variety of variables and more general question on

breastfeeding practice for babies of all ages to avoid overestimation in mothers' answers.

In summary, this study concluded that the determinants of exclusive breastfeeding in Indonesia based on the 2017 IDHS were bottle feeding, child's age, and mother's parity. Mothers need to be more aware of exclusive breastfeeding to maximize child's growth and development

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### CONFLICT OF INTEREST DISCLOSURE

The authors declare that there is no conflict of interest.

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