

# Determinants of Exclusive Breastfeeding Practice in Indonesia: Analysis of Demographic and Health Surveys Program (DHS) 2017

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## ABSTRACT

**Background:** Breastfeeding is the cornerstone of child survival, nutrition, and development. The World Health Organization (WHO) recommends exclusive breastfeeding for the first 6 months of life. The objective of this study is to estimate the prevalence of being not exclusive breastfeeding and to identify determinants factors associated with exclusive breastfeeding practice in Indonesia. **Methods:** A cross-sectional study was conducted among all mother with last infant of 0-5 months age enlisted in the woman's individual questionnaires of Indonesian Demographic and Health Surveys Program (DHS) 2017. Total sample of 1,446 infants were analyzed after applied the weighted setting analysis. Multiple logistic regression analysis were applied in this research. **Results:** Prevalence of being not exclusive breastfeeding was 57.3%. The results of multivariate analysis showed an increased risk of being not exclusive breastfeeding in the group with early initiation of breastfeeding for > 1 hour (corrected PR= 1.80, 95% CI: 1.60-1.86) compared with ≤ 1 hour. Infants who drank from bottle with nipple, had a greater risk of being not exclusive breastfeeding (corrected PR = 1.71, 95% CI: 1.48-1.68). Delivery by caesarean section, had a greater risk of being not exclusive breastfeeding (corrected PR = 1.14, 95% CI: 1.00-1.28). Compared with infants of 0-1 months age, there were increased risk of being not exclusive breastfeeding along with increasing age of infants (corrected PR = 1.17, 95% CI: 1.03-1.33 for 2-3 months age, and corrected PR = 1.32, 95% CI: 1.19-1.48 for 4-5 months age). Compared with preceding birth interval for 24-60 months, first child had a greater risk of being not exclusive breastfeeding (corrected PR = 1.15, 95% CI: 1.01-1.27). There was an interaction variables between early initiation of breastfeeding and drank from bottle with nipple **Conclusion:** Determinants of being not exclusive breastfeeding were initiation of breastfeeding, drank from bottle with nipple, delivery by section casarean, infants age, and preceding birth interval. There is need to increase health promotion regarding the factors associated with breastfeeding practice to the mothers especially on promoting early initiation of breastfeeding and the avoidance the using of bottle with nipple.

**Keywords:** Exclusive breastfeeding, infants, Indonesia, determinant

## 1. INTRODUCTION

The report of breastfeeding published by UNICEF's Nutrition Section in 2018, stated that UNICEF and WHO recommend exclusive breastfeeding without any additional food or fluids, not even water, for the first six months [1]. The level national regulation of exclusive breastfeeding practice in Indonesia was regulation of Republic Indonesia government number 33, 2012 [2]. The regulation declare that the definition of exclusive breastfeeding was giving only breast milk to the infant since birth up to 6 months without add and/or replace with other foods or drinks. Decree of ministry of health of

Republic Indonesia number 450/MENKES/SK/IV/2004 recommend exclusive breastfeeding for the first six months and be continued until 2 years old of child [3] Breastfeeding is the cornerstone of child survival, nutrition and development and maternal health [4].

Breast milk is the best nutrition for the infant because it contains the most suitable nutrients for growths and development for the child. the benefits of breast milk have been widely recognized. Global Breastfeeding Advocacy Initiative for the Best Start in Life proposed by UNICEF and WHO (2015) summarize several benefits of breastfeeding.

Breastfeeding protects against illness and death from the first hour of a baby's life through age two or later, it supports healthy brain development, benefits maternal health by improving birth spacing and reducing the risk of post-partum haemorrhage, decreases the risk of non-communicable disease, provides a natural, renewable food, mitigates inequities in access to health services, key component of every child's human right to the highest attainable standard of health [5]. In 2012, the World Health Assembly (WHA) Resolution 65.6 endorsed a Comprehensive Implementation Plan on Maternal, Infant and Young Child Nutrition [6]. One of six global nutrition targets for 2025 is to increase the rate of exclusive breastfeeding in the first 6 months up to at least 50%. This target implies that the current global average, estimated to be 37% for the period 2006-2010, should increase to 50% by 2025 [7]. The strategic plan of the ministry of health of Republic Indonesia for 2015-2019 in the document of decree of ministry of health number HK.02.02/MENKES/52/2015 declare that within 2015-2019 the target of proportion infants aged less than 6 months was 50% [8].

Based on World Bank income grouping, Indonesia was categorized as middle-income countries. In low- and middle-income countries, even in countries with the lowest breastfeeding rates nearly 9 in 10 babies are breastfed. Differences in breastfeeding rates are not only seen between countries with different income levels but also between rich and poor groups *within* countries. Evidence suggests that in high-income countries, it is mothers from poorer households who are less likely to breastfeed. This is in contrast to low- and middle-income countries, where the small percentage of mothers who do not breastfeed come, for the most part, from wealthier households [5].

Based on the report of IDHS 2017, 52% infant under 6 months of age were given exclusive breastfeeding in Indonesia. Exclusive breastfeeding was defined as given the child exclusive breastfeeding for infant 0-5 months of age within the period of one day prior to the survey [9].

Many factors contribute to creating a positive environment for breastfeeding. At the national level, policies guaranteeing parental leave and the right to breastfeed in the workplace are critical, as are restrictions on the marketing of breastmilk substitutes. Within health facilities, mothers need information and support to breastfeed immediately after birth, and beyond. Positive social norms that support and encourage breastfeeding, including in public spaces, serve to empower mothers to breastfeed. In communities, support from trained counsellors and peers, including other mothers and family members plays a key role. The support of men, husbands and partners cannot be underestimated [1]. The objective of this study is to estimate the prevalence of being not exclusive breastfeeding and to identify determinants factors associated with exclusive breastfeeding practice in Indonesia

## 2. METHODS

This cross-sectional study conducted using secondary data of Indonesia Demographic Health Survey (IDHS) 2017. IDHS 2017 was conducted in 34 provinces in Indonesia. Population of this study is all mother with

last infant of 0-5 months in Indonesia. In order to test the hypothesis, the minimum sample was counted using hypothesis test for difference of proportion, with an  $\alpha$  error = 0.05 and power = 0.80. Minimum total sample required was 696 infants [12]. All mother with last infant of 0-5 months of age enlisted in the woman's individual questionnaires of IDHS 2017 were recruited through the sampling technique of IDHS 2017 that were 1,573 respondents. These respondents selected through complex sample design from 1,970 census blocks including urban and rural area. The sampling frame for IDHS 2017 used the census block master sample from 2010 population census, while the households selection was from the list of an update households from the selected census block. Total sample of 1,466 infants were analyzed after applied the weighted setting analysis.

Inclusion criteria were last child, 0-5 months of infant age, child is alive, child usually lives with the respondent. Exclusion criteria were missing data on infant age and exclusive breastfeeding, a pair of twins of the last child.

Dependent variable of the study was exclusive breastfeeding (yes and no) based on compute of five variables in the questionnaires about breastfeeding. Exclusive breastfeeding was defined if a mother 1) answered "still breastfeeding" for question of duration of breastfeeding in months, 2) currently breastfeeding, 3) answered "no" for question of eating any solid, semi solid or soft foods yesterday, 4) answered "none" for question of number of times ate solid, semi solid or soft foods yesterday, and 5) answered "no" for question given child anything other than breast milk in first 3 days.

The definition of each exposures variables was based on standard recode manual for IDHS 2017. The significance of association between risk factors and exclusive breastfeeding practice in bivariate analysis were analyzed using chi-square test. If the prevalence of an outcome of interest (being not exclusive breastfeeding) is high (>10%), the corrected Prevalence Ratio (PR) would be calculated based on the Prevalence Odds Ratio (POR) from logistic regression [13]. Multiple logistic regression were applied to identify the determinants of exclusive breastfeeding practice in multivariate analysis. The study uses the formula Zhang and Yu (1998) shown as follows to count a corrected PR:  $\text{Corrected RR} = \text{OR} (1 - P_0) + (P_0 \times \text{OR})$  Since this study was a cross-sectional, RR would be PR, and OR would be POR.  $P_0$  indicates the prevalence of the outcome of interest in the nonexposed group. IDHS 2017 was categorized under the broader institutional review board approval of The DHS-7 Program and this project complies with all of the requirements of "Protection of Human Subjects".

## 3. RESULTS

The prevalence of being not exclusive breastfeeding in this study was 57.3% (Table 1). On the maternal reproduction characteristics (Table 1), we presented variables of early initiation of breastfeeding in two different definition. First definition was just time after the birth at which the respondent first breastfed the child without considering whether the respondents put the baby on mother's chest and bare skin. The proportion of early initiation of breastfeeding

≤ 1 hour in term of this definition was 55.6%. But when we come up to the second definition which also considering whether the respondents put the baby on mother's chest and bare skin, the proportion drops to 39.5%. Table 3 presents bivariate analysis of exclusive breastfeeding practice by socio-demographic characteristics. Based on the magnitude of an association, almost corrected PR of all variables in the socio-demographic characteristics show that the value were close to 1.0 indicates that the exposure was not consider to have a strong association with the outcome. Table 4

presents bivariate analysis of exclusive breastfeeding practice by maternal reproduction and infants characteristics. For early initiation of breastfeeding, we use definition which also considering whether the respondents put the baby on mother's chest and bare skin. Early initiation of breastfeeding for > 1 hour, had a greater risk of being not exclusive breastfeeding (corrected PR = 1.72, 95% CI: 1.60-1.84) compared with early initiation of breastfeeding for ≤ 1 hour. Delivery by caesarean section, had a greater risk of being not exclusive breastfeeding

**Table 1** Characteristics of Respondents

Variable	Category	N (1,446)	%	Variable	Category	N (1,446)	%
<b>Socio-Demographic</b>	<b>Maternal Age</b>			<b>Infants Characteristics</b>	<b>Sex of Child</b>		
	≤ 20 years	149	10.3		Male	720	49.8
	21-34 years	1,022	70.7		Female	725	50.2
	≥35 years	275	19.0		<b>Age of Infants</b>		
	<b>Maternal Education</b>				0-1 month	361	25.0
	Higher	228	15.8		2-3 month	556	38.5
	Secondary	858	59.4		4-6 month	529	36.6
	Primary or no education	359	24.8		<b>Preceding Birth Interval</b>		
	<b>Maternal Occupation</b>				< 24 months	104	7.2
	Unemployed	860	59.5		24-60 months	387	26.8
	Employed	585	40.5		>60 months	519	35.9
	<b>Socioeconomic</b>				First child	435	30.1
	Quintile upper	529	36.6		<b>Drank From Bottle with Nipple</b>		
	Quintile middle	329	22.8		No	1,036	71.7
	Quintile lower	587	40.6		Yes	400	27.7
	<b>Type of Place of Residence</b>				<b>Health Care</b>		
	Urban	656	45.4		<b>Antenatal Care Frequency</b>		
Rural	789	54.6	≥4 times	1,271	88.2		
<b>Husband Education<sup>a</sup></b>			0-3 times	171	11.8		
Higher	211	14.9	<b>Delivery Care Facilities</b>				
Secondary	813	57.4	Public/Government sector	545	37.7		
Primary or no education	391	27.6	Private sector	676	46.8		
<b>Maternal Reproduction</b>			Home	225	15.6		
<b>Exclusive Breastfeeding</b>			<b>Postnatal Check Within 2 Months</b>				
Yes	632	43.7	Yes	918	64.1		
No	813	56.3	No	514	35.9		
<b>Parity</b>			Traditional Birth Attendant	63	6.9		
Multipara	1,010	69.9	<b>Postnatal Check Provider<sup>b</sup></b>				
Primipara	435	30.1	Midwife/Nurse	720	78.8		
<b>Amenorrhea</b>			Pediatrician/Obstetrician/GP	131	14.4		
Yes	734	50.8	Traditional Birth Attendant	63	6.9		
No	712	49.2	<b>Counselled on Breastfeeding</b>				
<b>Early Initiation of Breastfeeding</b>			Yes	828	57.9		
≤ 1 hour	804	55.6	No	601	42.1		
> 1 hour	642	44.4	<b>Observed on Breastfeeding</b>				
<b>Early Initiation of Mother's Breastfeeding + Put on Chest and Bare Skin</b>			Yes	731	51.2		
≤ 1 hour	571	39.5	No	696	48.1		
> 1 hour	875	60.5					
<b>Delivery by Caesarean Section</b>							
No	1,186	82.1					
Yes	259	17.9					

<sup>a</sup>Missing 30, <sup>b</sup>Missing 531

**Table 2** Characteristics of Respondents Presented in Term of Numeric

Variable	Mean (SD)	SD	95% CI for Mean	Median	Range
Maternal age	28.68	6.30	28.36-29.1	28.00	15-47
Parity	2.25	1.31	2.18-2.32	2.00	1-12
Age of infants	2.78	1.55	2.70-2.86	3.00	0-5
Antenatal care frequency	7.99	3.67	7.80-8.18	8.00	0-28

Infants who drank from bottle with nipple, had a greater risk of being not exclusive breastfeeding (corrected PR = 1.59, 95% CI: 1.49-1.68). Table 6 showed that almost corrected PR of all variables in the socio-demographic characteristics show that the value were close to 1.0 indicates that the exposure was not consider to have a strong association with the outcome.

Table 6 presents a final model of multiple logistic regression consisted of five variables. Early initiation of breastfeeding for > 1 hour, had a greater risk of being not exclusive breastfeeding (corrected PR= 1.80, 95% CI: 1.60- 1.86) compared with early initiation of breastfeeding for ≤ 1 hour. Infants who drank from bottle with nipple, had a greater risk of being not exclusive breastfeeding (corrected PR = 1.71, 95% CI: 1.48-1.68). Delivery by caesarean section, had a greater risk of being not exclusive breastfeeding (corrected PR = 1.14, 95% CI: 1.00-1.28). Compared with infants of 0-1 months age, there were increased risk of being not exclusive breastfeeding along with increasing age of infants (corrected PR = 1.17, 95% CI: 1.03-1.33 for 2-3 months age, and corrected PR = 1.32, 95% CI: 1.19-1.48 for 4-5 months age). Compared with preceding birth interval for 24-60 months, first child had a greater risk of being not exclusive breastfeeding (corrected PR = 1.15, 95% CI: 1.01-1.27). There was an interaction variables between early initiation of breastfeeding and drank from bottle with nipple (p value of interaction = 0.014).

The adjusted POR dan adjusted corrected PR for interaction variables were:

- 1) For the group of mothers who did early initiation of breastfeeding, drank from bottle from nipple had a greater risk of being not exclusive breastfeeding (adjusted POR = 5.03, 95% CI: 3.25-7.76). After being corrected, adjusted PR = 2.28, 95% CI: 1.94-2.57
- 2) For the group of mothers who did not do early initiation of breastfeeding, drank from bottle from nipple had a greater risk of being not exclusive breastfeeding (adjusted POR = 2.51, 95% CI: 1.82-3.46). After being corrected, adjusted PR = 1.30, 95% CI: 1.21-1.38

#### 4. DISCUSSIONS

The prevalence of being not exclusive breastfeeding in this study was 57.3% and this means that the prevalence of exclusive breastfeeding was 43.7% (Table 1). Compared with the report of IDHS 2017, 52% infant under 6 months of age were given exclusive breastfeeding [9]. This finding was not that different but there were slight difference of definition used in IDHS 2017. Exclusive breastfeeding was defined as given the child exclusive breastfeeding for infant 0-5 months of age

within the period of one day prior to the survey.

Based on Indonesian Health Profile 2017, the national coverage of exclusive breastfeeding was 61.33% [10]. Another nasional survey, National Basic Health Research 2018, revealed that proportion of giving the child only breastmilk breastfeeding for infant 0-5 months of age within last 24 hours was 74.5 % (95% CI: 73.0-76.0). Definition that used for in this survey was a composit from question:

- 1) whether the child still breastfed,
- 2) within last 24 hours given breastmilk only and not given other food/drink [11].

Compared with the target 50% of exclusive breastfeeding for the first 6 months proposed by WHO and ministry of health of Republic Indonesia, the prevalence of exclusive breastfeeding in this study was a slightly lower than the targets [7,8]. But we have to carefully interpret this findings because of the definition of exclusive breastfeeding in this study was only until the current age of infants when the survey was conducted. If the child was 2 months old, the exclusive breastfeeding status is also for the first 2 months.

When the prevalence of an outcome of interest (being not exclusive breastfeeding) in the study population is low (<10%), the POR is close to the PR. However the more frequent the outcome becomes, the more the POR will overestimate the PR when it is more than 1 or underestimate the PR when it is less than 1. Logistic regression is a widely used technique to adjust for confounders, not only in case control studies but also in cohort or cross-sectional study. However, logistic regression yields a POR rather than PR, even in a cross-sectional study. Under the same rule, when the outcome of interest is common in the study population (though it could be rare in the general population), the adjusted POR from multiple logistic regression may exaggerate a PR This is what underlies us to count the corrected PR rather than POR using a simple formula that can be applied not only in binary analysis but also in multivariate analysis [13] The prevalence of being not exclusive breastfeeding was >10%. In cross-sectional study, if the prevalence of outcome is more than 10% and the POR is more than 2.5 or less than 0.5, correction of the POR may be desirable to more appropriately interpret the magnitude of an association [5] Table 6 presents a final model of multiple logistic regression.

The multivariate analysis using logistic regression from study of Suparmi (2012) about determinants of exclusive breastfeeding in infants of 0-5 months old using Indonesian DHS 2012 showed that age of infants, antenatal care visit, prelacteal feeding, and drank from bottle with nipple were determinants of exclusive breastfeeding [14]. Early initiation of breastfeeding for > 1 hour, had a greater

risk of being not exclusive breastfeeding (corrected PR= 1.80, 95% CI: 1.60-1.86) compared with early initiation of breastfeeding for ≤ 1 hour. Report published by UNICEF in 2018, stated that UNICEF and WHO recommend initiation of breastfeeding within the first hour of life. Breastfeeding, initiated within the first hour of birth, provided exclusively for six month, and continued up to two years or beyond with the provision of safe and appropriate complementary foods, is one of the most powerful practices for promoting child survival and wellbeing [1]. The level national regulation of exclusive

breastfeeding practice in Indonesia was regulation of Republic Indonesia government number 33, 2012 [2]. The regulation declare that the early initiation of breastfeeding is carried out when the mother and baby are stable and do not require medical action for at least 1 hour. The duration of the early initiation if breastfeeding is at most as short as 1 hour so that it can find the mother's nipple and feed itself. Only 44% of the world's newborns are put to the breast within 1 hour of birth. Even fewer infants under 6 months of age are exclusively breastfed.

**Table 3** Bivariate Analysis of Exclusive Breastfeeding Practice by the Socio-Demographic Characteristics

Socio-Demographic Characteristics	Exclusive Breastfeeding				Total	Crude POR (95% CI)	p value	Corrected Crude PR (95% CI)
	No		Yes					
	n	%	n	%				
<b>Maternal Age</b>								
≤ 20 years	92	61.7	57	38.3	149	1.33 (0.93-1.89)	0.188	1.13 (0.97-1.27)
21-34 years	560	54.8	462	45.2	1.022	1		1
≥35 years	161	58.8	113	41.2	274	1.17 (0.89-1.53)	0.249	1.07 (0.95-1.19)
<b>Maternal Education</b>								
Higher	126	55.3	102	44.7	228	1		1
Secondary	479	55.8	379	44.2	858	1.03 (0.76-1.37)	0.866	1.01 (0.88-1.14)
Primary or no education	209	58.2	150	43.7	359	1.13 (0.81-1.57)	0.477	1.05 (0.91-1.19)
<b>Maternal Occupation</b>								
Unemployed	491	57.0	370	43.0	861	1		1
Employed	323	55.1	263	44.9	586	0.93 (0.75-1.14)	0.476	0.97 (0.87-1.06)
<b>Socio-economic</b>								
Quintile upper	319	60.3	210	39.7	529	1		1
Quintile middle	176	53.3	154	46.7	330	0.75 (0.57-0.99)	0.045	0.88 (0.77-1.00)
Quintile lower	319	54.3	268	45.7	587	0.78 (0.62-0.99)	0.043	0.90 (0.80-1.00)
<b>Type of Place of Residence</b>								
Urban	364	55.5	292	44.5	656	1		1
Rural	449	56.9	340	43.1	789	1.06 (0.86-1.31)	0.576	1.03 (0.93-1.12)
<b>Husband Education</b>								
Higher	113	53.6	98	46.4	211	1		1
Secondary	455	56.0	358	44.0	813	1.09 (0.81-1.48)	0.562	1.04 (0.90-1.18)
Primary or no education	228	58.3	163	41.7	391	1.21 (0.86-1.69)	0.275	1.09 (0.93-1.23)

**Table 4** Bivariate Analysis of Exclusive Breastfeeding Practice by the Marital Reproduction dan Infants Characteristics

Maternal Reproduction and Infants Characteristics	Exclusive Breastfeeding				Total	Crude POR (95% CI)	p value	Corrected Crude PR (95% CI)
	No		Yes					
	n	%	n	%				
<b>Parity</b>								
Multipara	556	55.0	454	45.0	1,010	1		1
Primipara	257	59.1	178	40.9	435	1.17 (0.94-1.48)	0.164	1.07 (0.97-1.17)
<b>Early Initiation of Breastfeeding</b>								
≤ 1 hour	223	39.1	347	60.9	570	1		1
> 1 hour	590	67.4	285	32.6	875	3.22 (2.59-4.01)	0.000	1.72 (1.60-1.84)
<b>Delivery by Caesarean Section</b>								
No	632	53.3	553	46.7	1,185	1		1
Yes	181	69.9	78	30.1	259	2.03 (1.52-2.71)	0.000	1.31 (1.19-1.42)
<b>Sex of Child</b>								
Male	408	56.7	312	43.3	720	1		1
Female	406	55.9	320	44.1	726	0.97 (0.79-1.19)	0.794	0.99 (0.90-1.07)
<b>Age of Infants</b>								
0-1 month	172	47.6	189	52.4	361	1		1
2-3 month	317	57.0	239	43.0	556	1.46 (1.12-1.91)	0.005	1.20 (1.06-1.33)
4-5 month	325	61.4	204	38.6	529	1.76 (1.35-2.31)	0.000	1.29 (1.16-1.42)

<b>Preceding Birth Interval</b>								
< 24 months	53	51.0	51	49.0	104	0.92 (0.60-1.42)	0.717	0.96 (0.76-1.16)
24-60 months	204	52.7	183	47.3	387	1		1
>60 months	300	57.8	219	42.2	519	1.23 (0.94-1.60)	0.125	1.10 (0.97-1.22)
First child	257	59.1	178	40.9	435	1.30 (0.98-1.71)	0.066	1.12 (0.99-1.24)
<b>Drank From Bottle with Nipple</b>								
No	500	48.3	536	51.7	1,036	1		1
Yes	307	76.8	93	23.3	400	3.55 (2.73-4.62)	0.000	1.59 (1.49-1.68)

**Table 5** Bivariate Analysis of Exclusive Breastfeeding Practice by the Health Care Characteristics

Health Care Characteristics	Exclusive Breastfeeding				Total	Crude POR (95% CI)	p value	Corrected Crude PR (95% CI)
	No		Yes					
	n	%	n	%				
<b>Antenatal Care Frequency</b>								
≥4 times	712	56.0	560	44.0	1,272	1		1
0-3 times	101	59.1	70	40.9	171	1.13 (0.82-1.57)	0.449	1.05 (0.91-1.19)
<b>Delivery Care Facilities</b>								
Public/Government sector/UKBM	291	53.4	254	46.6	545	1		1
Private sector	388	57.4	288	42.6	676	1.18 (0.94-1.47)	0.163	1.08 (0.97-1.18)
Home	135	60.0	90	40.0	225	1.31 (0.95-1.79)	0.097	1.12 (0.98-1.26)
<b>Postnatal Check Within 2 Months</b>								
Yes	532	58.0	386	42.0	918	1		1
No	276	53.7	238	46.3	514	0.84 (0.68-1.05)	0.122	0.93 (0.83-1.02)
<b>Postnatal Check Provider</b>								
Midwife/Nurse	417	57.9	303	42.1	720	1		1
Pediatrician/Obstetrician/GP	78	59.5	53	40.5	131	1.07 (0.73-1.57)	0.712	1.03 (0.87-1.18)
Traditional Birth Attendant	35	55.6	28	44.4	63	0.91 (0.54-1.53)	0.724	0.96 (0.74-1.17)
<b>Counselled on Breastfeeding</b>								
Yes	458	55.3	370	44.7	828	1		1
No	341	56.7	260	43.3	601	1.06 (0.86-1.31)	0.578	1.03 (0.93-1.12)
<b>Observed on Breastfeeding</b>								
Yes	398	54.5	332	45.5	730	1		1
No	399	57.3	297	42.7	696	1.12 (0.91-1.38)	0.279	1.05 (0.96-1.14)

**Table 6** Results of Multiple Logistic Regression Analysis for Breastfeeding Practices

Variable	β	p value	Adjusted POR (95% CI)	Adjusted Corrected PR (95% CI)
Early Initiation of Breast Feeding	1.315	0.000	3.72 (2.60-4.14)	1.80 (1.60-1.86)
Drank From Bottle with Nipple	1.630	0.000	5.10 (2.70-4.66)	1.71 (1.48-1.68)
Delivery by Caesarean Section	0.315	0.049	1.37 (1.00-1.88)	1.14 (1.00-1.28)
Age of Child (0-1 months)		0.000	1	1
Age of Child (2-3 months)	0.320	0.031	1.38 (1.06-1.89)	1.17 (1.03-1.33)
Age of Child (4-5 months)	0.618	0.000	1.86 (1.45-2.61)	1.32 (1.19-1.48)
Preceding Birth Interval (24-60 months)		0.096	1	1
Preceding Birth Interval (< 24 months)	-0.076	0.752	0.93 (0.58-1.49)	0.97 (0.74-1.18)
Preceding Birth Interval (> 60 months)	0.329	0.026	1.39 (1.03-1.83)	1.15 (1.01-1.27)
Preceding Birth Interval (first child)	0.186	0.230	1.20 (0.90-1.65)	1.09 (0.95-1.23)
Early Initiation of Breast Feeding Drank From Bottle With Nipple	-0.692	0.014	0.50 (0.29-0.87)	
<b>Group Who Did Early Initiation of Breast Feeding</b>				
Drank from bottle with nipple (no)			1	1
Drank from bottle with nipple (yes)			5.03 (3.25-7.76)	2.28 (1.94-2.57)
<b>Group Who Didn't Do Early Initiation of Breast Feeding</b>				
Drank from bottle with nipple (no)			1	1
Drank from bottle with nipple (yes)			2.51 (1.82-3.46)	1.30 (1.21-1.38)

Globally, less than 40% of children under 6 months of age are fed only breastmilk with no additional foods or liquids, including water [5]. Infants who drank from bottle with nipple, had a greater risk of being not exclusive breastfeeding (corrected PR = 1.71, 95% CI: 1.48-1.68). Decree of ministry of health of Republic Indonesia number 450/MENKES/SK/IV/2004 had arranged 10 steps to success breastfeeding. One of the steps was not using bottle with nipple to infant (KMK 450/MENKES/SK/IV/2004). These findings were in line with study of Suparmi (2014), showed that adjusted OR of not using bottle from nipple with the successful of breastfeeding was 15.05 (95% CI: 0.01-0.04) [14]. But the magnitude of association in the study of Suparmi (2014) was very high. This might be an impact of the using OR as an association measures.

Delivery by caesarean section, had a greater risk of being not exclusive breastfeeding (corrected PR = 1.14, 95% CI: 1.00-1.28). The study of Kandeel et al (2018) revealed that infants born by caesarean section were had OR = 1.429 times (95% CI: 1.056-1.934) more likely to be artificially fed than to be exclusively breastfed [15].

Compared with infants of 0-1 months age, there were increased risk of being not exclusive breastfeeding along with increasing age of infants (corrected PR = 1.17, 95% CI: 1.03-1.33 for 2-3 months age, and corrected PR = 1.32, 95% CI: 1.19-1.48 for 4-5 months age). This findings were

There was an interaction variables between early initiation of breastfeeding and drank from bottle with nipple (p value of interaction = 0.014). The adjusted POR dan adjusted corrected PR for interaction variables were:

- 1) For the group of mothers who did early initiation of breastfeeding, drank from bottle from nipple had a greater risk of being not exclusive breastfeeding (adjusted POR = 5.03, 95% CI: 3.25-7.76). After being corrected, adjusted PR = 2.28, 95% CI: 1.94-2.57)
- 2) For the group of mothers who did not do early initiation of breastfeeding, drank from bottle from nipple had a greater risk of being not exclusive breastfeeding (adjusted POR = 2.51, 95% CI: 1.82-3.46). After being corrected, adjusted PR = 1.30, 95% CI: 1.21-1.38

The risk of drank from bottle with nipple in mothers who did early initiation of breastfeeding, was higher (adjusted PR = 2.28, 95% CI: 1.94-2.57) than in mothers who did not do early initiation of breastfeeding (adjusted PR = 1.30, 95% CI: 1.21-1.38). The use of bottle from nipple can affect the infant's response to direct breastfeeding. Aside from that, the use of bottle from nipple can affect breast milk production of mothers.

There were interaction between variables of early initiation of breastfeeding and drank from bottle from nipple. Based on the magnitude of adjusted corrected PR,

## 5. CONCLUSION

The prevalence of being not exclusive breastfeeding in this study was 57.3%. Determinants of being not exclusive breastfeeding were initiation of breastfeeding, drank from bottle with nipple, delivery by caesarean section, infants age, and preceding birth interval. There were interaction between variables of early initiation of breastfeeding and drank from bottle from nipple. Based on

in line with study of Suparmi (2014), showed that based on adjusted OR, compared with infants 4-5 months, there were increased successful breastfeeding along with the decreasing age of infants (adjusted OR = 3.04, 95% CI: 1.97-4.71 for 2-3 months age, and adjusted OR = 4.37, 95% CI: 2.75-6.96 for 0-1 months age) [14].

Study of determinants of exclusive breastfeeding practices in Ethiopia using DHS data, showed that in multivariate analysis, as the age of child increases the rate of exclusive breastfeeding decreased significantly. Compared with infants of 0-1 months age, there were increased risk of being not exclusive breastfeeding along with increasing age of infants (adjusted OR = 2.3, 95% CI: 1.7-3.3 for 2-3 months age, and adjusted OR = 5.0, 95% CI: 3.5-7.1 for 4-5 months age) [16]. But the magnitude of association in the study of Suparmi (2014) was very high. This might be an impact of the using OR as an association measures. Compared with preceding birth interval for 24-60 months, first child had a greater risk of being not exclusive breastfeeding (corrected PR = 1.15, 95% CI: 1.01-1.27). Community based cross-sectional study of Asemahagn (2016) was conducted among 346 mothers with infants aged between 0-6 months. The adjusted OR showed that birth interval for 1-2 years, had lower tendency to give exclusive breastfeeding (adjusted OR = 0.58, 95% CI: 0.31-1.12) compared with birth interval for 3-4 years [17].

drank from bottle with nipple in the group of mothers who did early initiation of breastfeeding was considered as the strongest determinant of being not exclusive breastfeeding (adjusted PR = 2.28, 95% CI: 1.94-2.57). Although most variables in final model of multivariate analysis showed a significant p value, but if we take a look from the magnitude of association, the adjusted corrected PR were not far from 1. This means that the determinants only give small effect to predict exclusive breastfeeding. The present study was carried out with cross-sectional study. This brings the advantages because it is suitable for estimating the prevalence of an outcome in the national level. The role of chance was considered as minimal since this was a national survey with a big data set. However, there are several limitations of this presents study. First, the definition of exclusive breastfeeding in this study was only until the current age of infants when the survey was conducted. This definition was not actually the same with the standard definition of exclusive breastfeeding (giving only breast milk to the infant since birth up to 6 months without add and/or replace with other foods or drinks). Second, there might be information bias for the past event of respondents that may tend to give misclassification of measures of exposure or outcome status. Third, temporal ambiguity might be affect the result since this was a cross-sectional study.

the magnitude of adjusted corrected PR, drank from bottle with nipple in the group of mothers who did early initiation of breastfeeding was considered as the strongest determinant of being not exclusive breastfeeding (adjusted PR = 2.28, 95% CI: 1.94-2.57).

Although most variables in final model of multivariate analysis showed a significant *p* value, but if we take a look from the magnitude of association, the adjusted corrected PR were not far from 1. This means that the determinants only give small effect to predict exclusive breastfeeding. There is need to increase health promotion regarding the factors associated with breastfeeding practice to the mothers especially on promoting early initiation of breastfeeding and the avoidance the using of bottle with nipple.

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