

## ORIGINAL ARTICLE

# Breastfeeding and the Risk for Diarrhea Morbidity Among Children in Indonesia

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## ABSTRACT

**Introduction:** Breastmilk is essential nutrition for a baby. Lack of exclusive breastfeeding among infants 0-6 months of age is associated with increased diarrhea morbidity and mortality. This study aimed to determine the relationship between the history of breastfeeding in infants aged 0-6 months and the incidence of diarrhea at the age of 0-12 months. **Methods:** A cross-sectional study was carried out in hospitalized children at the Kraton and Brendan Hospitals, Pekalongan Regency. The sampling technique was consecutive sampling, and a total of respondents were 122. Data analysis used Pearson Correlation. **Result:** Demographic characteristics found the average maternal age was 31.84 years (SD 7.063), employment status was 82.7% not working, the education status was 46.7% low education, frequency of ANC in pregnancy at least four times was 86.9%, and sex of the child was 60% male. The analysis results showed that the average duration of breastfeeding was 3.17 months, and the average incidence of diarrhea was 0.93 times. The Pearson correlation test obtained a p value of 0.001 with a correlation value of -0.364. **Conclusion:** There is a relationship between the history of exclusive breastfeeding and the average incidence of diarrhea in infants aged 0-12 months, and the longer infants aged 0-6 months given only breast milk, they have a lower risk of diarrhea.

**Keywords:** Breastfeeding; Diarrhea; Infants

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## INTRODUCTION

The World Health Organization (WHO) recommends exclusive breastfeeding for the first six months of life, followed by continued breastfeeding with appropriate complementary foods for up to 2 years or beyond (1). The phenomenon is not all babies aged 0-6 months get exclusive breastfeeding. The Ministry of Health of the Republic of Indonesia issued the Basic Health Research results in 2018 showed that there were 37.8% of infants aged 0-5 months in Indonesia did not receive exclusive breastfeeding (2). The coverage of exclusive breastfeeding in Central Java Province in 2019 was 66% and in Pekalongan District was 57,2% (3). The data confirmed that number of baby who did not receive exclusive breastfeeding were low either in national area and in local area.

The factors that influence a baby not getting exclusive breastfeeding have been widely studied. The study of Isyti'aroh, Rofiqoh, and Aktifah in 2019 found the failure of exclusive breastfeeding due to a lack of mother's knowledge and false myths about breastmilk and exclusive breastfeeding (4). A previous study found some factors that influence mothers did not practice exclusive breastfeeding. A previous study found some factors that influence mothers did not practice exclusive breastfeeding. Factors related to the failure of exclusive breastfeeding were divided into three factors, namely sociodemographic factors, health factors and psychosocial factors. Sociodemographic factors consist of knowledge, occupation, age, environment and socio-culture. Health factors consist maternal parity, Body Mass Index, and psychological consist of attitudes, breastfeeding intentions, family support, support from health workers and information obtained by the mother (5)

Babies who are not exclusively breastfed are more susceptible to diseases, such as diarrhea. Adhiningasih's

study in 2020 showed that exclusive breastfeeding was one factor that increases the incidence of diarrhea in children (6). Similarly, a study conducted by Dagneu, et al. in 2019 showed that no exclusive breastfeeding was one of the predictors of diarrhea (7).

The data from the Basic Health Research in 2018 explains that the prevalence of diarrhea in Indonesia was 8.0% (95% CI 7.8-8.1). Based on age group, the prevalence of diarrhea in less than one year was 10.6% (95% CI 9.9-11.3), aged 1-4 years 12.8% (95% CI 12.4-13.2). ), and age 5-14 years 7.0% (95% CI 6.8-7.2%) (2). In addition, the prevalence of diarrhea in Central Java was 11,1% (2). However, in Pekalongan district, infant who suffer diarrhea in general hospital was 40,4% which 77,7% of them did not receive exclusive breastfeeding (8,9). Diarrhea was main cause of toddlers to be hospitalized, and mortality among children under 5 of age in Indonesia (2). Concerning on the big number of diarrhea in hospital and the low coverage of exclusive breastfeeding in this area attract attention to be studied, what are the relationship between exclusive breastfeeding and diarrhea incidence among children.

The incidence of diarrhea in children makes the authors interested in examining the history of breastfeeding in hospitalized children because of diarrhea at the Pekalongan district hospital. The purpose of the study was to determine the relationship between the history of breastfeeding in infants aged 0-6 months and the incidence of diarrhea at the age of 0-12 months.

**MATERIALS AND METHODS**

This study was used a correlational descriptive study with a cross-sectional design. The variables were the history of nutrition in infants 0-6 months and the frequency of diarrhea in infants aged 0-12 months. The respondents were the mother of hospitalized children at the Pekalongan district hospital with diarrhea. The sampling technique used a consecutive sampling for about 6 months from November 2019 until April 2020, reached around 122 respondents. The study focus on children with diarrhea who hospitalized in general hospital in Pekalongan District which are Kraton general hospital and Kajen general hospital. The instrument used a questionnaire containing demographic data, history of breastfeeding and the frequency of diarrhea experienced at 0-12 months. The variable of history of breastfeeding means the breastfeeding duration that define as the length of mother giving exclusive breastfeeding from 0 to 6 month, and counting by the number of months. The the frequency of diarrhea means the mean of frequency of diarrhea which suffer by children in Pekalongan district hospital. The data were analyzed using Pearson’s Product Moment Correlation.

**ETHICAL CLEARANCE**

This study was approved by research institute and community service (LPPM) state University of Muhammadiyah Pekajangan Pekalongan by number 587.3/PT/LPPM/VII/2020 and the permission of Regional Development Planning Agency, Pekalongan Regency by research certificate no. 070/934

**RESULT**

A total of 122 samples of mothers participated in this study. Table I presents the characteristics of the respondents. More than half of the respondents had a baby boy (60.7%), and the rest had a baby girl (39.3%). The majority of the respondents worked as a housewife (82.7%), had low educational status (86.9%), and performed antenatal care more than four times (86.9%). The mean score of age was 31.84 years old.

**Table I Demographic characteristics of respondents**

**(N=122)**

Characteristics	n	Percentage (%)
Baby’s Gender		
Male	74	60.7
Female	48	39.3
Job Status		
Housewife	101	82.7
Employee	21	17.3
Mother’s Education		
High	16	13.1
Low	106	86.9
Frequency of Antenatal Care		
>4 times	106	86.9
< 4 times	16	13.1
Age	31.84	
MSD	7.06	

Table II shows the mean score of the duration of exclusive breastfeeding, the incidence of diarrhea among the infants, and its correlation. The mean score of the period of exclusive breastfeeding was 3.17 months, while the mean score of the incidence of diarrhea was 0.93 times. There was a significant and negative correlation between exclusive breastfeeding and the incidence of diarrhea (p-value = 0.000; r = -0.364). It can be interpreted that the longer time to give breastfeeding, the less frequent diarrhea among the infants.

**Table II Mean score of breastfeeding duration, the incidence of diarrhea and its correlation**

Variable	Mean	Standard Deviation	<i>p value</i>	<i>r</i>
Breastfeeding duration	3.17	2.277	0.001	- 0.364
Incidence of diarrhea	0.93	1.204		

## DISCUSSION

The current study suggested a significant correlation between the exclusive breastfeeding period and the incidence of diarrhea. This study found the mothers aged around 31.84 years, meaning they are in the range of productive age and a safe age for reproduction. Mostly the mothers did not work, and the level of educational status was low to moderate. These findings were in line with data released by the Ministry of Women's Empowerment and Child Protection and the Central Statistics Agency (2019) that the status of family workers was 22.57%, while the education level of Indonesian women, the highest education among 32.53% women at the age of 15 years and over were senior high school (10). Women are still lagging compared to men in this level of the education

The study found that most mothers performed ANC visits more than four times (86.9%). The Ministry of Health suggested a minimum of four examinations (2). During ANC visits, the mothers will perform activities such as measuring height, weight, blood pressure, fetal heart rate, fundal size, checking fetal position, measuring upper arm circumference (LILA), giving immunizations tetanus toxoid (TT), giving blood-added tablets (TTD), providing counseling and therapy (2).

The results showed that the average duration of breastfeeding in a month was 3.17 months. It is shown that the average length of breastfeeding does not achieve the global World Health Assembly (WHA), which minimum of 50% for the rate of exclusive breastfeeding in the first six months of babies' life (11). Several studies identified the causes of failure to exclusive breastfeeding. Isyti'aroh., Rofiqoh, & Aktifah's investigation found the factors significantly associated with exclusive breastfeeding were knowledge (p-value 0.001) and false myths about breastmilk and breastfeeding (p-value 0.0001) (4). A study by Wendiranti, Subagio & Wijayanti (2017) showed that the risk factors for failure of exclusive breastfeeding were husbands' support, place of delivery at the first health facility, and wrong information by health workers (12). Previous study stated that the reason of exclusive breastfeeding failure before 12 weeks the age of baby was the perception of mother about insufficiency of their breastmilk supply. The higher family support and the low level of depression decrease the appearance of breastfeeding problems (13). A previous study conducted by Baghel and Singh in India

identified the determinants of the failure of exclusive breastfeeding for mothers residing in Satna, Madhya Pradesh Hamper, similar to the study findings found in Indonesia. The study showed that the failure factors for exclusive breastfeeding were the perception that breast milk was not enough, lack of knowledge about the benefits of exclusive breastfeeding, mother starting to work again, health problems, and mother returning pregnancy (14).

Hawkins et al. found that obesity was associated with a short duration of exclusive breastfeeding. Increasing the duration of exclusive breastfeeding to six months needs attention from all parties (15). Several studies have also shown that professional health workers, practitioners, and social support first-time breastfeeding mothers were significant for mothers to start and maintain exclusive breastfeeding (16).

Exclusive breastfeeding is vital for babies. Many studies show the benefits of breast milk for babies. For example, breast milk can protect infants from infectious diseases, atopic diseases, cardiovascular disease, leukemia, necrotizing enterocolitis, and common intestinal diseases. Breastfed babies will have better neurodevelopment, increased intelligence, good concentration power, and prevent behavioral disorders (17). The risk of infant mortality decreased in breastfed babies by around 36%. Breastfeeding has proven to avoid death by 13% compared to formula breastfeeding (17). Some negative impacts of formula breastfeeding were increased risk of oral disease, changing the shape of teeth, disrupting the gut microbiota, and infant thermoregulation (17).

According to this study result that found the relationship between the history of exclusive breastfeeding and the average incidence of diarrhea in infants aged 0-12 months, and the longer infants aged 0-6 months given only breast milk, they have a lower risk of diarrhea by p value of 0.001. It has been determined that reastfeeding could reduce the incidence of diarrhea. Consistent with this study, Adhiningsih's study identified that exclusive breastfeeding could decrease the incidence of diarrhea among Indonesian children (7). Previous study in Rural China by Li, yue, Abbey, Medina and Shi in 2018 found that breastfeeding was associated with lower rates of diarrhea at 6-12 months and at 12-18 months (18). Similarly, a study from African Countries in 2021 by Apanga, Weber, Darrow, Riddle, Tung, Liu and Garn, stated that by Exclusively breastfed to children had 33% lower odds of diarrhea than those who were not give exclusive breadtfeeding (aPOR=0.67, 95% CI=0.56, 0.78) (19). In contrast to the meta analysis sudy by Shen, Zhang, Zhu, and Chen's study in 2018 that found no relationship between the rotavirus causes diarrhea and breast milk. This study did not verify the relationship between rotavirus diarrhea and breastfeeding and the length of exclusive breastfeeding (20).

Breastmilk can protect baby from many many infectious deases particularly diarrhea because breastmilk contain esential component such lysozyme, immunoglobulin, lactoferin, and casein,. Lysozyme also as a bacterocidal and anti-inflammatory which activity increases aggressively starting after 6 months after the birth of the baby, and Immunoglobulin acts as an anti-bacterial and virus (21).

A study about the function of lactoferrin to treat diarrhea also proves that by giving bovine lactoferrin may shorten the length of diarrheal infection and reduce the severity of diarrhea (22). Lactoferrin serves as a bacteriocidal particularly in e Coli, some of enteric virus such as rotavirus and calicivirus, and also parasites such as Giardia and Entamoeba histolytica. Lactoferrin can inhibit bacterial growth. It able to bind and degrade the specific virulence protein to depress the capability of enteric pathogens to infect the human cells (22).

Casein play a role as a inhibitor the Microbes to mucous membranes. Casein as a prebiotics and promotes the microbiota growth. Casein prevents the adhesion of pathogens to the epithelial cell surface in the gastrointestinal and respiratory tract by forming a new molecules (para-k-casein and caseinomacropetide) in the gut's lumen (21). Lysozyme also as a bacterocidal and anti-inflammatory which activity increases aggressively starting after 6 months after the birth of the baby, and Immunoglobulin acts as an anti-bacterial and virus.(21).

Breast milk can prevent infant morbidity and mortality, including diarrhea because its nutritional content is called colostrum, the first secretion from the mammary glands after birth is rich in antibodies (23). Likewise, the protein content in transitional and mature breast milk is very suitable for the baby's needs for optimal growth and development and prevents various infectious and non-infectious diseases. Based on these facts, breast milk is very important for the baby's life.

Breast milk is the perfect food for an infant's in the first six months of life as ideal nourishment and protection from many infections, including diarrheal diseases. Breastfeeding also stimulates the infant's immune system, improves response to vaccinations, and provides many health-enhancing molecules, enzymes, proteins, and hormones. Breast milk is the primary supply of such polyclonal polyreactive SIgA in the initial stages of neonatal colonization, and it provides strong pathogen resistance while promoting colonization of commensal microbiota (24).

## CONCLUSION

It can be concluded that there was a relationship between exclusive breastfeeding and the incidence of diarrhea among infants. The longer the baby gains exclusive breastfeeding, the less the incidence of

diarrhea. The study also found that majority of mother was low education and housewife. Thus, it is better if the nurse improve the activity of delivering the health education about lactation or exclusive breastfeeding among pregnant women particularly from low education and housewife, and all parties support the mother for the success of breastfeeding.

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