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## The Relationship Of Exclusive Breastfeeding With The Incident Rate Of Diarrhea In Babies Aged 0-6 Months

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### Abstract:

**Background:** Exclusive breastfeeding can contribute to reducing morbidity and mortality, as well as preventing infectious diseases in babies, such as diarrhea. Diarrhea has the potential to become an Extraordinary Event (KLB) and is one of the causes of death in every age group, especially children under 5 years of age. This study aims to determine the incidence of diarrhea in babies aged 0-6 months who receive exclusive breast milk and non-exclusive breast milk and to determine the risk between babies who receive exclusive breast milk and babies who do not receive exclusive breast milk regarding the incidence of diarrhea.

**Materials and Methods** The type of research in this study was an analytical survey with a case-control cohort retrospective design conducted at the Pasar Rebo District Health Center, with a sample size (n) of 60 babies. The total sample was 60, 30 babies (50%) with exclusive breast milk and 30 babies (50%) with non-exclusive breast milk.

**Results:** Babies who received exclusive breast milk had a history of diarrhea, which was less, namely one baby (3.3%) while babies who did not receive exclusive breast milk (33.3%). Statistical data shows ( $p = 0.003$  ( $p < 0.05$ ) and the Odds Ratio obtained between these two variables is 0.69 with 95% CI between 1.45 - 1.88 and the value  $r = -0.388$  with  $p = 0.002$ . There is a significant relationship between a history of diarrhea and a history of exclusive breastfeeding in babies aged 0-6 months at the Pasar Rebo District Health Center. The value of  $r = -0.388$  with  $p = 0.002$  obtained concludes that if exclusive breastfeeding is increased, the incidence of diarrhea in babies will decrease.

**Conclusion:** There is a significant relationship between a history of diarrhea and a history of exclusive breastfeeding in babies aged 0-6 months at the Pasar Rebo District Health Center. The value of  $r = -0.388$  with  $p = 0.002$  obtained concludes that if exclusive breastfeeding is increased, the incidence of diarrhea in babies will decrease.

**Key Word:** Breast milk, breastfeeding, diarrhea, exclusive breastfeeding..

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### I. Introduction

Breast milk (ASI) is the best food choice that is ideal for health, meeting nutritional needs, and for a baby's growth and development. According to UNICEF, breast milk is a gift from the mother to every child. It is a gift because many researchers have proven that breast milk and early breastfeeding have many benefits and advantages, both for the baby and the mother<sup>2,3,4,5</sup>. The benefits of breast milk for babies consist of various aspects<sup>2</sup>. First, from a nutritional aspect, breast milk contains colostrum. Colostrum contains 10-17 times more immune substances than formula milk which contains glycans, immunoglobulin A/IgA, glycans, when-casein, docosahexaenoic (DHA), arachidonic acid (AA), lactoferrin, lysozyme, as well as Bifidus factor which plays a role as a protective/immune factor for babies as well as supporting the growth and development of the baby's brain<sup>1,2</sup>. Then if seen from a psychological aspect, breastfeeding can create a warm relationship between the child and the mother, while from an economic aspect, breastfeeding does not require costs to use, This is because breast milk is produced directly by the mother<sup>2</sup>. Meanwhile, the benefits of breastfeeding for mothers, according to the research results of Chowdhury et al, also Victoria, breastfeeding can protect mothers from breast cancer. Apart from that, it can also protect mothers against the risk of postpartum bleeding, liver disease, ovarian cancer, and type 2 diabetes<sup>3,4</sup>.

The World Health Organization (WHO) and the United Nations Children's Fund (UNICEF) recommend that breastfeeding be given to babies by early initiation starting from the first hour after the baby is born, which is then given exclusively (only giving breast milk without additional food or fluids, even water), in the first six months) and continue to receive complementary breast milk (MPASI) for up to two years.

UNICEF says, such breastfeeding can contribute to reducing morbidity and mortality, as well as preventing chronic diseases in babies<sup>1</sup>. UNICEF says that increasing breastfeeding rates throughout the world will be able to save the lives of more than 820,000 children, 87% of whom are children under 6 months of age<sup>1</sup>.

The contribution of breast milk in reducing morbidity and mortality in babies has been proven by several epidemiological studies which state that breast milk with its protective factors is a <sup>10</sup> to protect babies against various infectious diseases such as diarrhea and pneumonia which are the main causes of death and morbidity in children under 5 years of age<sup>1,6,35,37</sup>.

Diarrhea is the occurrence of defecation with a more liquid consistency than usual which can cause the body to lose a lot of electrolytes and various minerals that are important for the body. UNICEF said that until now diarrhea is still the main killer of children<sup>1,6</sup>. In 2016, 8% of deaths in children under 5 years of age worldwide were caused by diarrhea. More than 1,300 children die every day, or around 480,000 children die annually worldwide due to diarrhea<sup>1</sup>. The cause of death caused by diarrhea is often due to complications from untreated dehydration.

Diarrhea has the potential to become an Extraordinary Event (KLB) <sup>10</sup> and is one of the causes of death in every age group, especially children under 5 years of age<sup>7,8</sup>. In 2018, Diarrhea Outbreaks occurred 10 times spread across 8 Provinces, including West Java, Bali, West and East Nusa Tenggara, West Kalimantan, Central Sulawesi, Maluku, and Papua<sup>8</sup>. The death rate / Case Fatality Rate (CFR) in each Diarrhea Outbreak tends to increase annually. <sup>3</sup> in 2017 the CFR for Diarrhea was 1.97% and increased to 4.76% in 2018<sup>7,8</sup>. The number of diarrhea sufferers in Indonesia continues to increase every year, therefore this disease is still the country's main health problem that must be addressed. Diarrhea cases among toddlers in DKI Jakarta are included in the high category, this was recorded in the 2018 National Diarrhea Patient Service Coverage Data for Toddlers. DKI Jakarta was ranked second <sup>3</sup> highest in 2018, namely (68.54%) after West Nusa Tenggara (75, 88%).<sup>8</sup> This is thought to be related to the low coverage of exclusive breastfeeding for children in the DKI Jakarta area. The 2018 Strategic Plan target for ensuring exclusive baby breastfeeding is 47%. Nationally, the coverage of babies receiving exclusive breast milk in 2018 has reached the target of 68.74%, however, the achievement <sup>11</sup> for DKI Jakarta is still less than the target of 45.29%<sup>8</sup>. The results of Roesli's research in 2000 stated that babies who do not receive exclusive breast milk are 14.2 times more likely to suffer from diarrhea when compared to babies who are <sup>3</sup> exclusively breastfed.

Based on the background described above, it is necessary to conduct research on "The relationship between exclusive breastfeeding and the incidence of diarrhea in babies aged 0-6 months at the Pasar Rebo Community Health Center."

## <sup>2</sup> <sup>1</sup>1. Material And Methods

This research is a study of the relationship between exclusive breastfeeding and the incidence of diarrhea in infants aged 0-6 months at the Pasar Rebo District Health Center at <sup>12</sup> Integrated Management Clinic for Sick Toddlers (MTBS) and the Maternal and Child Health Clinic (KIA). Data collection was carried out using a questionnaire. The method for collecting data is the purposive-nonprobability sampling method, sample selection is based on the researcher's own considerations. From the research results, it was found that the number of samples <sup>25</sup> of toddlers aged more than or equal to 6 months was 60 people

**Study Design:** The type of research used in this study is an analytical survey with a retrospective case-control cohort design, namely a data analysis method to determine whether exposure is different between cases and controls, namely with a retrospective approach

**Study Location:** <sup>1</sup> This research was conducted at the Pasar Rebo Community Health Center, East Jakarta

**Study Duration:** August to December 2019.

**Sample size:** 60 patients.

**Sample size calculation:** The sample selection method in this research was purposive-non-probability sampling method, namely sample selection based on the researcher's own considerations. The samples used in this study were toddlers aged more than or equal to 6 months who were visiting the District Health Center. Rebo Market

### **Inclusion criteria:**

- 1) Toddlers aged more than or equal to 6 months
- 2) Children under five who have been exclusively breastfed
- 3) Children under five who are not exclusively breastfed
- 4) Toddlers who have had diarrhea
- 5) Toddlers who have never had diarrhea

6) Pasar Rebo District Community

**Exclusion criteria:**

- 1) Toddlers aged less than 6 months
- 2) Not the people of Pasar Rebo District

**Procedure methodology**

Data collection

Data collection was carried out using primary data obtained from questionnaires. Then recording will be carried out according to the required variables. Data Collection Procedures

- 1) Submit a request to the dean's secretariat to receive a cover letter for borrowing maternal and child surveillance data from the Pasar Rebo District Health Center as secondary data in the thesis research.
- 2) Submit the letter to the East Jakarta Health Sub-Department and the Head of the Pasar Rebo District Health Center
- 3) Complete the research permit administration
- 4) After obtaining permission, then distribute questionnaires to mothers of pediatric patients who come to the puskesmas.

Research Instrument

Research instruments are tools used to obtain research data. <sup>11</sup> The instruments used in this research were questionnaire sheets, notebooks, pens, pencils and laptops

**Statistical analysis**

Data Management and Analysis

Data Management

The data that has been collected is then processed using a computer using the SPSS for Windows 24.00 Version computer program, as follows:<sup>34</sup>

1. Edit Data (Editing)

The data that has been collected will be corrected and checked for completeness.

2. Providing Code (Coding)

Data is differentiated based on each category. Each category is given a code to simplify the data processing process.

3. Enter Data (Entry)

The data that has been coded is then entered into the data processing system using SPSS for Windows 24.00 Version.

4. Data Cleaning (Cleaning)

Data cleaning is done manually or computerized. In data cleaning, the data will be re-checked so that it will be detected if there are data entry errors or missing data.

Data analysis

Univariate analysis

<sup>2</sup> This analysis is used to determine the frequency distribution of the independent and dependent variables with the aim of seeing the variations of each variable (Dahlan, 2012).

Bivariate analysis

<sup>8</sup> This analysis is used to measure the closeness of the relationship between the dependent variable and the independent variable. The statistical tests used in <sup>3</sup> this research are Chi-Square and Odd Ratio. At the 95% confidence level. With this confidence level, if the  $p\text{-value} \geq 0.05$  then the statistical calculation results are meaningful (significant).

**III. Result**

<sup>3</sup> Data collection was carried out in November 2019 regarding the relationship between exclusive breastfeeding and the incidence of diarrhea in babies aged 0-6 months at the <sup>2</sup> Pasar Rebo District Health Center at the Integrated Management Poly for Sick Toddlers (MTBS) and the Maternal and Child Health Polyclinic (KIA). Data collection was carried out using a questionnaire. The method for collecting data is the purposive-probability sampling method, and sample selection is based on the researcher's considerations. From the <sup>1</sup>

research results, it was found that the number of samples of toddlers aged more than or equal to 6 months was 60 and the following research results were obtained:

Univariate Analysis

2 Univariate analysis in this study will describe the frequency distribution of all research variables. The dependent variable is the history of diarrhea in children, and the independent variables are the respondent's education level, respondent's occupation, respondent's income, child's age, child's gender, order of number of children, child's weight at birth, exclusive breastfeeding, early initiation of breastfeeding (IMD), knowledge and respondent behavior and other factors such as water and waste management.

Characteristics of Respondents (Mother)

Respondent Demographics (Mothers) 3

In terms of final education, the majority of respondents (mothers) were high school graduates as many as 26 people (43.4%), followed by Diploma/Bachelor graduates as many as 20 people (33.3%), junior high school graduates as many as 9 people (15%) and the highest frequency was The few that are elementary school graduates are 5 people (8.3%). Data distribution as in diagram 1 below:

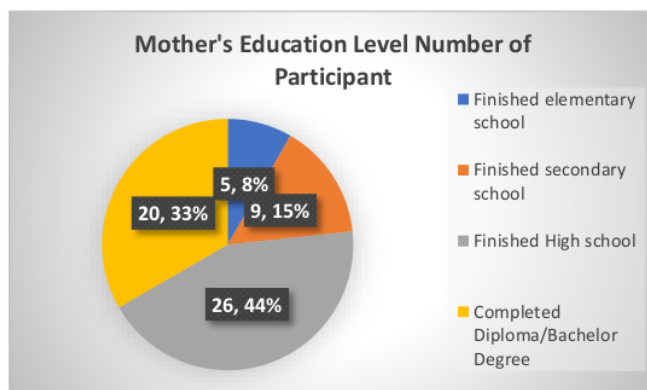


Diagram 1. Distribution of Mother's Educational Status

Based on diagram 2 below, the majority of respondents do not work/are housewives, namely 46 respondents (76.67%), 9 respondents (15%) work as private employees, 3 respondents (5%) are self-employed and 2 respondents others (3.33%) work as Civil Servants (PNS). Data distribution as in diagram 2 below:

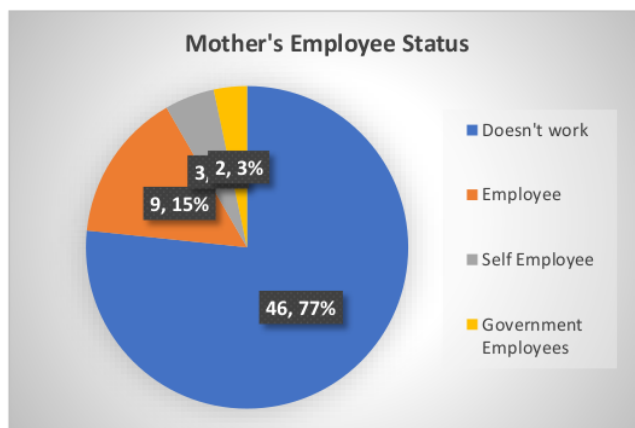
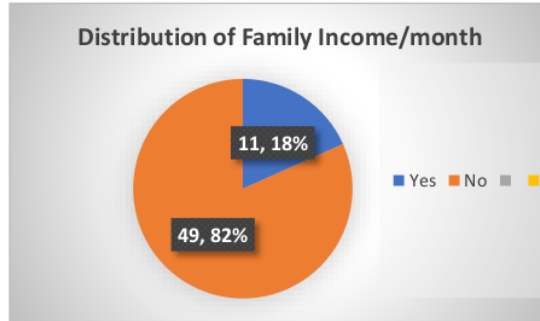


Diagram 2. Mother's Employee Status

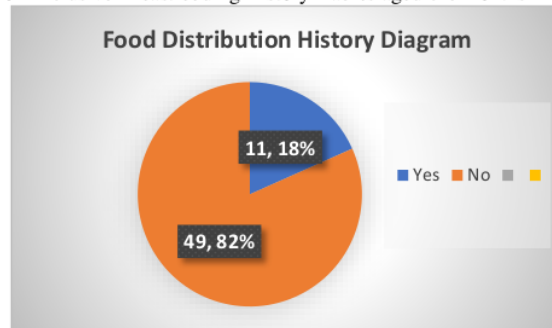
*The Relationship Of Exclusive Breastfeeding With The Incident Rate Of Diarrhea In Babies.....*

Diagram 3 shows that the family income of most of the respondents was more than 3,500,000/month, namely 35 respondents (58.3%), and the monthly family income of 25 other respondents was less than 3,500,000. Data distribution as in diagram 3 below:



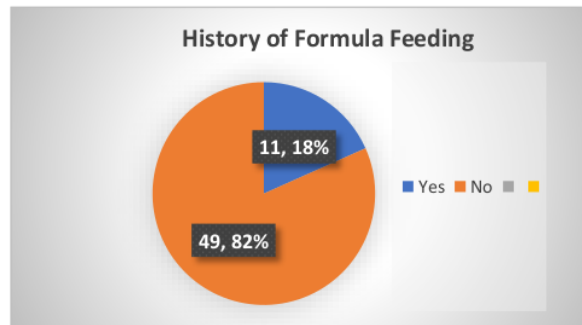
**Diagram 3. Distribution of Family Income/Month**

Exclusive breastfeeding  
Frequency Distribution of Exclusive Breastfeeding History Babies aged 0-6 months



**Diagram 4. Food Distribution History**

Based on diagram 3, this research found that 30 respondents (50%) gave exclusively breast milk and the other 30 respondents (50%) did not give exclusive breast milk



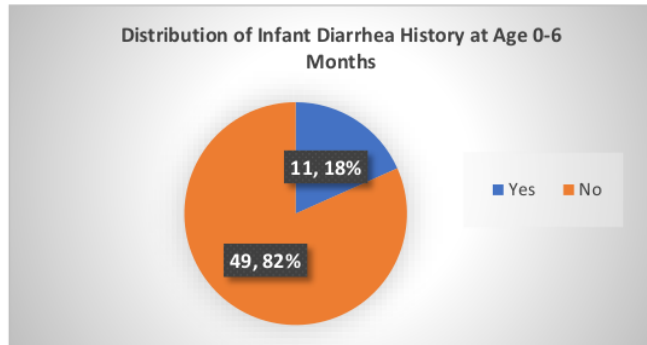
**Diagram 5. History of Formula Feeding**

<sup>3</sup> Diagram 5 shows that the majority of respondents who had a history of giving formula milk to babies when the baby was 0-3 months old were 16 respondents and 11 other respondents gave formula milk to babies when the baby was 3-6 months old.

**History of Diarrhea**

Frequency Distribution of Diarrhea History in Children

Based on diagram 6 below, it shows that the majority of children did not have a history of diarrhea at the age of 0-6 months, namely 49 children (81.67%) but 11 children (18.33%) had a history of diarrhea at the age of 0-6 months.



**Diagram 6. Distribution of Infant Diarrhea History at Age 0-6 Months**

**Bivariate Analysis**

Bivariate analysis in this research was carried out using the chi square statistical test to see whether there was a significant relationship between the dependent and independent variables, then the analysis continued with the Odds Ratio. The incidence of diarrhea in children aged 0-6 months who receive exclusive and non-exclusive breast milk is shown as in Table 1 below:

**Table 1. Correlation between the incidence of diarrhea at the age of 0-6 months and exclusive breastfeeding**

History of Breastfeeding	Number Who Have a History of Diarrhea						PValue	OR (95% CI)
	Yes		No		Total			
	N	%	N	%	N	%		
Exclusive breastfeeding	1	3.3	29	96.7	30	100		0.69
Non-exclusive breast milk	10	33.3	20	66.7	30	100	0.003	1.45-1.88
<b>Total</b>	<b>11</b>	<b>18.3</b>	<b>49</b>	<b>81.7</b>	<b>60</b>	<b>100</b>		

Based on Table 1, it shows that babies who received exclusive breast milk had less of a history of diarrhea (3.3%) compared to babies who did not receive exclusive breast milk (33.3%).

**The relationship between the incidence of diarrhea in children aged 0-6 months and maternal knowledge and behavior**

**Table 2. The relationship between the incidence of diarrhea in children aged 0-6 months and maternal knowledge and behavior**

Maternal Knowledge and Behavior Variables	History of Diarrhea						P Value
	Yes		No		Total		
	N	%	N	%	N	%	
<b>Mother's knowledge about exclusive breastfeeding</b>							
Yes	10	20.4	39	79.6	49	100	<b>0.349</b>
No	1	9.1	10	90.9	11	100	
<b>The mother takes the child to the doctor/health center when the child has diarrhea</b>							
Yes	11	21.2	41	78.8	52	100	<b>0.176</b>
No	0	0	8	100	8	100	
<b>Mother's knowledge that breast milk contains many nutrients for babies</b>							
Yes	11	19	47	81	58	100	<b>0.664</b>
No	0	0	2	100	2	100	

Based on table 2, it shows that of the 11 children who had a history of diarrhea, 10 mothers (20.4%) knew the meaning of exclusive breastfeeding, but 1 mother (9.1%) did not. All mothers whose children had a history of diarrhea took their children for treatment to a doctor/health center (21.2%). All mothers (19%) whose children had diarrhea at the age of 0-6 months know that breast milk contains many nutrients for babies.

**The relationship between the incidence of diarrhea in the last 4 months and the history of diarrhea in children aged 0-6 months**

Of the 11 babies who had a history of diarrhea between the ages of 0-6 months, 7 babies (33.3%) had diarrhea in the last 4 months while the other 4 babies (10.3%) did not suffer from diarrhea in the last 4 months as described in table 3 below:

**Table 3. The relationship between the incidence of diarrhea in the last 4 months and the history of diarrhea in children aged 0-6 months**

Diarrhea for the last 4 months	History of Diarrhea in the first 0-6 Months						PValue
	Yes		No		Total		
	N	%	N	%	N	%	
Yes	7	33.3	14	89.4	21	100	
No	4	10.3	35	53.8	39	100	<b>0.034</b>
<b>Total</b>	<b>11</b>	<b>18.3</b>	<b>49</b>	<b>81.7</b>	<b>60</b>	<b>100</b>	

**IV. Discussion**

In research conducted at the Pasar Rebo District Health Center, 60 respondents were mothers and their children/babies. These respondents were divided into two large groups, namely 30 respondents (50%) who were recorded as giving breast milk exclusively to 15 babies and 30 respondents (50%) who were recorded as not giving breast milk exclusively to their babies. Exclusive breastfeeding is giving only breast milk without giving other food and drinks or even water to the baby from birth to 6 months, except for medicines and vitamins<sup>10</sup>. Non-exclusive breastfeeding can be categorized as predominant breastfeeding, namely breastfeeding the baby but never being given a little water or other water-based drinks, other than breast milk, for example, such as formula milk, tea, soft rice, etc. as prelacteal drinks/food before breast milk comes out to the baby and partial breastfeeding, namely breastfeeding the baby but having been given artificial food other than breast milk such as formula milk, porridge, or other food before the baby six months old either given continuously or given as prelacteal food<sup>10</sup>

Diarrhea is a symptom of a digestive tract infection which can be caused by bacteria, viruses and parasites. Diarrhea is characterized by changes in the shape and consistency of loose stools and a frequency of defecation (defecation) of more than 3 times/day in infants and 4 times/day in neonates.

Based on diagram 4.15, the results show that the incidence of diarrhea is more often experienced or suffered by babies after the baby is more than 6 months old, namely 26 babies (43.33%) while when the baby is between 0-6 months old, there are 11 babies (18.33%). This is the same as the results of research conducted by Rahabeat F and Atussoleha M, namely that the majority of diarrhea cases occurred in children aged 6-12 months.<sup>32,33</sup>

The babies who were exclusively breastfed had less of a history of diarrhea (3.3%) compared to babies who did not receive exclusive breast milk (33.3%). Statistical data shows (p) = 0.003, meaning p < 0.05, so it can be concluded that there is a significant relationship between a history of diarrhea and a history of exclusive breastfeeding in babies aged 0-6 months at the Pasar Rebo District Health Center. The Odds Ratio obtained between these two variables is 0.69 with a 95% CI between 1.45-1.88, which means that children who are not exclusively breastfed have a 0.69 times greater risk of suffering from diarrhea compared to children who are exclusively breastfed. Based on statistical data, the value r = -0.388 with p = 0.002 was also obtained, so it can be concluded that if exclusive breastfeeding is increased, the incidence of diarrhea in babies will decrease.

This is the same as what is said by the American Academy of Pediatrics, namely that one of the potential protective effects of breast milk on babies which cannot be denied is a reduction in the incidence or severity of diarrhea. The protective effect of breast milk on the incidence of diarrhea is none other than because breast milk is equipped with various bioactive components starting from the initial phase of lactation, namely colostrum to mature milk. According to the Indonesian Data and Information Center, colostrum contains 10-17 times more bioactive components than mature milk<sup>10</sup>. Bioactive components function as protective substances that babies really need. These bioactive components include (1) anti-microbial factors, (2) immunostimulating peptides, (3) growth factors<sup>14</sup>. Some bioactive components are multifunctional. There are components that function as anti-microbial factors, also function as immune stimulants and even as growth



supporting factors, such as lactoferrin, oligosaccharides, lysozyme, cytokines, colostrin and other protective substance.

The results of this study support the hypothesis stated in the previous chapter, namely that there is a significant relationship between exclusive breastfeeding and the incidence of diarrhea in babies aged 0-6 months at the Pasar Rebo District Health Center. The World Health Organization (WHO) and the United Nations Children's Fund (UNICEF) recommend that breastfeeding be given to babies by early initiation starting from the first hour after the baby is born, which is then given exclusively (only giving breast milk without additional food or fluids, even water), in the first six months and continue to receive complementary breast milk (MAMI) for up to two years. Based on diagram 4.10, the majority of respondents (78.3%) had carried out Early Breastfeeding Initiation (EBI) with the help of post-natal health workers. There are 5 babies who received EBI experienced diarrhea (10.6%) while 6 babies who did not receive EBI experienced diarrhea with a p value of 0.009, so it can be concluded that there is a significant relationship between the child's history of diarrhea at the time of birth, aged 0-6 months, with Early Initiation of Breastfeeding (EBI).

Several results show the frequency distribution of several variables regarding maternal knowledge and behavior. Of 11 children who had a history of diarrhea, 10 mothers (20.4%) knew the meaning of exclusive breastfeeding, but 1 mother (9.1%) did not with p value = 0.349 (p > 0.05). All mothers whose children had a history of diarrhea took their children for treatment to a doctor/health center (21.2%) obtained p value = 0.176 (p > 0.05). All mothers (19%) whose children had diarrhea at the age of 0-6 months knew that breast milk contains many nutrients for babies with a p value of 0.664 (p > 0.05). From the results of obtaining a p value of > 0.05 for each variable of maternal behavior and knowledge, it can be concluded that in this study the incidence of diarrhea and maternal knowledge and behavior did not have a significant relationship.

## V. Conclusion

Based on the results of research and discussions that have been carried out at the Pasar Rebo District Health Center, it can be concluded as follows:

1. The incidence of diarrhea in babies aged 0-6 months who received exclusive breast milk in this study was 23.3%.
2. The incidence of diarrhea in babies aged 0-6 months who did not receive exclusive breast milk in this study was 33.3%.
3. The Odds Ratio obtained between exclusive breastfeeding and diarrhea in this study was between 1.45-1.88 with a CI of 95%, which means that children who do not receive exclusive breast milk have a risk between 1.45-1.88 times greater of suffering from diarrhea compared to children who receive exclusive breast milk.

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