Relationship Between Exclusive Breastfeeding and Birth Weight (BBL) to The Incidence of Respiratory Tract Diseases in Children at PKU Gamping Hospital

Gina Puspita[1*], Kalya Hasana[2]

[1]Department of Medical Science, Faculty of Medicine and Health Sciences, 55183 Universitas Muhammadiyah Yogyakarta, Indonesia
[2]Student, Faculty of Medicine and Health Sciences, Universitas Muhammadiyah Yogyakarta, Indonesia
*Corresponding Author:
Email: g.puspita26@gmail.com

Abstract.

Background: Exclusive breastfeeding during the first six months plays an important role in fulfilling nutritional needs and strengthening children's immunity against infections. However, exclusive breastfeeding coverage in Indonesia remains below the national target. Infants with abnormal birth weight are also more susceptible to infections, including respiratory tract diseases. Objective: To analyze the relationship between exclusive breastfeeding and birth weight with respiratory tract diseases among children at PKU Gamping Hospital. Methods: This analytical observational study used a cross-sectional design involving children aged 18 months to 5 years who visited the pediatric clinic of PKU Gamping Hospital from May to July 2025. A total of 86 children were selected using purposive sampling. Data were collected through questionnaires and analyzed using the chi-square test with a significance level of p<0.05. Results: Among 86 children, 53.5% were male and 46.5% female. Exclusive breastfeeding was significantly associated with respiratory diseases in children (p=0.017), while birth weight showed no significant association (p=0.202). Conclusion: Exclusive breastfeeding is significantly associated with respiratory diseases in children, whereas birth weight is not significantly associated.

Keywords*: Exclusive breastfeeding; birth weight and respiratory diseas.*

I. INTRODUCTION

Exclusive breastfeeding is given to infants aged 0 to 6 months without any other food or drink. Exclusive breastfeeding until 6 months is considered to meet all of a baby's needs because it contains a variety of nutrients such as protein, fat, carbohydrates in the form of lactose, and various vitamins and minerals. Furthermore, breast milk also contains a number of antibodies that can protect children from various diseases. (Alotiby, 2023).Based on the data, the percentage of exclusive breastfeeding fulfillment in the last 3 years in Indonesia has continued to increase, namely 71.58% in 2021, 72.04% in 2022, and 73.97% in 2023. However, this figure is said to be still low because it has not reached the government's target of 80% (Central Statistics Agency, 2024).In general, a normal birth weight (BW) for a baby is 2,500 grams to 4,000 grams. BW is closely related to the child's nutrition during pregnancy. A normal BW indicates adequate nutrition during pregnancy. Adequate nutrition also boosts the immune system, making the child less susceptible to illness.Babies with low birth weight (LBW) are at higher risk for health problems. This is because they do not receive adequate nutrition during pregnancy, resulting in a weakened immune system, which allows microorganisms to more easily enter the body. The effects of low birth weight (LBW) include respiratory problems, digestive problems, anemia, seizures, hypocalcemia, and stunting (Utami et al., 2024).Indonesia ranks ninth in the world, with a low birth weight (LBW) percentage of over 15.5% of births annually (Inpresari & Pertiwi, 2020). The 2021 Indonesian Health Profile shows that LBW is the leading cause of neonatal death in Indonesia, accounting for 34.5%.

One of the most common childhood illnesses is respiratory tract disease, for example asthma, pneumonia, and bronchitis. Several risk factors are associated with the occurrence of respiratory tract disease in children.children include the environment, nutritional status, immunization, including exclusive breastfeeding and BBL.Several previous studies have shown a link between exclusive breastfeeding and the incidence of respiratory tract infections. (Ahmed et al., 2021) reported that most infants who are not

exclusively breastfed have a higher risk of respiratory tract infections. Another study by (Rusady and Zulaikha, 2022) also found that infants who are exclusively breastfed have a lower risk of ARI compared to infants who are not exclusively breastfed. Furthermore, (Aisyiah, 2023) showed that infants with low birth weight (LBW) have a higher incidence of ARI than infants with normal birth weight.Given the important role of exclusive breastfeeding and birth weight in child health, particularly in the respiratory system, research is needed to assess the relationship between these two factors and the incidence of respiratory tract disease. Therefore, this study aims to analyze the relationship between exclusive breastfeeding and birth weight and the incidence of respiratory tract disease in children at PKU Gamping Hospital.

II. METHODS

StudyThis is an observational analytical quantitative study with a cross-sectional approach to determine the relationship between exclusive breastfeeding and newborn infants (BBL) with the incidence of respiratory diseases in children. The population in this study were all children aged 18 months to 5 years. The sample in this study were all pediatric patients at the pediatric polyclinic of PKU Gamping Hospital who met the inclusion and exclusion criteria with a total of 86 samples. The sample was taken using a purposive sampling method. The research instrument was a questionnaire given to the guardians of pediatric patients. Univariate and bivariate data were analyzed using the SPSS program.

Research result

Table 1. Respondent Characteristics

Characteristics	Frequency	Percentage
Age		
18 months	13	15.1
2 years	29	33.7
3 years	25	29.1
4 years	11	12.8
5 years	8	9.3
Gender		
Man	46	53.5
Woman	40	46.5
Exclusive Breastfeeding		
Given	64	74.4
Not given	22	25.6
Birth Weight		
Normal	74	86
Abnormal	12	14
Respiratory Diseases		
Not experiencing	14	16.3
Experienced or ever experienced experience	72	83.7

From table 4.1 above, it can be seen that of the 86 respondents at PKU Gamping Hospital who participated in this study, 13 children were 18 months old (15.1%), 29 children were 2 years old (33.7%), 25 children (29.1%) were 3 years old, 11 (12.8%) were 4 years old, and finally 8 (9.3%) were 5 years old. Based on the gender of the 86 respondents, 46 male patients (53.5%) and 40 female patients (46.5%). Viewed from the classification of exclusive breastfeeding, there were 64 (74.4%) while respondents who were not given exclusive breastfeeding were 22 (25.6%). Based on the classification of birth weight, respondents with normal birth weight were 74 respondents (86%) and respondents with abnormal birth weight were 12 respondents (14%). For the classification of respiratory diseases, 14 children (16.3%) did not experience respiratory diseases and 72 children (83.7%) experienced or had experienced respiratory diseases.

Table 2. Relationship between Exclusive Breastfeeding and the Incidence of Respiratory Diseases in Children

exclusive breastfeeding		Disease child's breathing		Amount	x^2	P
		No	Yes			
Yes	n	14	50	64	4,255	**0.017**
	%	10.4	53.6	64		
No	n	0	22	22		
	%	3.6	18.4	22		
Amount	n	14	72	86		
	%	14	72	86		

Table 2 shows a significant value ($p = 0.017 < 0.05$), indicating a significant relationship between exclusive breastfeeding and respiratory illnesses in children. These results indicate that H0 is rejected and Ha is accepted.

Table 3. Relationship between Birth Weight and the Incidence of Respiratory Diseases in Children

BBL		Disease child's breathing		Amount	x^2	p-value
		No	Yes			
Normal	n	14	60	74	1,501	**0.202**
	%	12.0%	62.0%	74.0%		
No normal	n	0	12	12		
	%	2.0%	10.0%	12.0%		
Amount	n	14	72	86		
	%	14.0%	72.0%	86.0%		

Table 3 shows a significance value of ($p = 0.202 > 0.05$), which means there is no significant relationship between birth weight and respiratory disease in children. These results indicate that H0 is accepted and Ha is rejected.

Discussion

The study, conducted on pediatric patients at PKU Gamping Hospital, aimed to analyze the relationship between exclusive breastfeeding and the incidence of respiratory illnesses in children and between newborns and the incidence of respiratory illnesses in children. The results showed that exclusive breastfeeding was significantly associated with respiratory illnesses.

1. The Relationship Between Exclusive Breastfeeding and the Incidence of Respiratory Diseases in Children

The results of this study indicate a significant association between exclusive breastfeeding and the incidence of respiratory illness in children ($p = 0.017$). Children who are not exclusively breastfed during the first 6 months have a higher risk of developing respiratory illness than children who are exclusively breastfed.Biologically, the protective mechanism of breast milk is closely related to its protective substances, such as immunoglobulin A (IgA), immunoglobulin M (IgM), lactoferrin, lysozyme, and phagocytic cells. These substances play a role in protecting the respiratory tract mucosa from invasion by pathogens that cause respiratory diseases. IgA functions to collect and destroy foreign substances, including viruses, bacteria, and fungi, while IgM functions to inhibit these toxins and neutralize toxins or poisons. This makes children who are not exclusively breastfed more susceptible to respiratory diseases (Asthiningsih et al., 2022).Furthermore, breast milk contains probiotic oligosaccharides, which help develop beneficial bacteria in a child's gut. These bacteria support the mucosal immune system, which connects the digestive and respiratory tracts through the gut-lung axis. Exclusively breastfed children have a more mature mucosal immune system and a more controlled inflammatory response to respiratory infections. Conversely, formula feeding increases the likelihood of exposure to contaminants from unsterilized water and increases the risk of respiratory infections (Wijaya, 2019).

This finding aligns with research by Rusady and Zulaikha (2022) in Pamekasan Regency, which reported that 80% of exclusively breastfed children did not experience acute respiratory infections (ARI), while 81.9% of non-exclusively breastfed children did. Similar findings were also demonstrated by Liaquat et al. (2022), who found that exclusive breastfeeding for the first six months reduced the risk of respiratory

infections by an odds ratio of 3.8.Exclusive breastfeeding is defined as the provision of breast milk without any other food or drink other than medication. Exclusive breastfeeding occurs during the first six months, after which time it can be supplemented with other foods or drinks, commonly referred to as complementary foods (MPASI) (The et al., 2023).According to the researcher's analysis, the lack of exclusive breastfeeding in children at PKU Gamping Hospital may be influenced by, among other things, the level of mothers' misunderstanding regarding the definition of exclusive breastfeeding. Several respondents stated that they had exclusively breastfed (for the first 6 months), but when asked about the age at which their children first received complementary foods, most answered less than 6 months. In addition, there are other influences on children not being exclusively breastfed by mothers at PKU Gamping Hospital, such as the mother's insufficient breast milk production, the mother being pregnant with the next child, and several other influences. The lack of exclusive breastfeeding in children at PKU Gamping Hospital is a risk factor for respiratory diseases in children.

2. The Relationship Between Birth Weight and the Incidence of Childhood Respiratory Diseases

The results of this study showed that there was no significant relationship between BBL and the incidence of respiratory disease in children (p = 0.202).This study aligns with (Magdaleni et al., 2020) who found that low birth weight (LBW) was not significantly associated with the incidence of ARI in toddlers in Samarinda City (p = 0.078). Similar results were also found by (Aisyiah, 2023) who reported that although low birth weight children suffered from ARI more frequently, the association was not statistically significant. However, other studies, such as those conducted by (Asthiningsih et al., 2022), found a significant correlation between a history of low birth weight (LBW) and an increased risk of ARI. This suggests that research findings on the relationship between low birth weight (LBW) and respiratory tract infections vary depending on population characteristics, environmental factors, and sample size.Low birth weight babies have immature organ function and immune systems, including the respiratory system. Low birth weight babies tend to have weaker mucosal immunity, with low immunoglobulin levels, making them susceptible to bacterial and viral infections.

Furthermore, lung and respiratory muscle growth and development are immature.This causes the mucociliary clearance mechanism to be suboptimal, making it easier for pathogens to enter and settle in the respiratory tract (Indonesian Ministry of Health, 2014).However, in this study, no significant relationship was found, possibly influenced by several factors, such as the relatively small number of respondents with abnormal BBL, so that the power of the test was limited, as well as the presence of confounding factors (nutritional status, immunization, environmental conditions) which were not fully controlled in this study, thus influencing the results.In theory, based on various previous studies, abnormal birth weight is a risk factor for respiratory disease in children. Therefore, further research into this variable is crucial to determine whether this theory is true or not. The findings of this study suggest that the sample at PKU Gamping Hospital was more influenced by other factors, such as exclusive breastfeeding, than by a history of abnormal birth weight.

III. CONCLUSION AND SUGGESTION

Conclusion

From the study "The Relationship between Exclusive Breastfeeding (ASI) and Birth Weight (BBL) to the Incidence of Respiratory Tract Diseases in Children at PKU Gamping Hospital", it was found that there was a significant relationship between exclusive breastfeeding and the incidence of respiratory tract diseases in children (p = 0.017) and there was no significant relationship between BBL and the incidence of respiratory tract diseases in children (p = 0.202). Exclusive breastfeeding has been shown to play an important role in increasing children's immunity against respiratory tract infections, while birth weight may have an indirect effect through nutritional factors and postnatal immunity. Other factors such as the environment, immunization status, and current nutritional status may also influence the incidence of respiratory tract diseases.

Suggestion

Parents are expected to understand the importance of exclusive breastfeeding for the first six months and monitoring the growth and development of children from the womb to prevent respiratory diseases.For health institutions, it is hoped that they can provide education to parents that needs to be strengthened regarding the importance of exclusive breastfeeding, birth weight, and other risk factors for preventing respiratory diseases.For future researchers, using a larger sample size, adding the number of independent variables other than exclusive breastfeeding and birth weight, using multivariate analysis to control confounding factors such as nutritional status, socio-economic conditions.

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