Vol. 3 No. 2 Year 2022
jurnal.umj.ac.id/index.php/MMJ
mmjfkk@umj.ac.id
e-issn: 2721–317X
Muhammadiyah Medical Journal

Research Article

Nutritional Status and Diarrhea in Toddlers Aged 0 – 59 Months

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ABSTRACT

Background: Diarrhea is one of the diseases that ranks in the top ten diseases in Depok City. Data from the Depok City Health Service (2020) states that diarrhea in toddlers is still above 5%. There are various factors (multifactor) related to diarrhea disease, one of which is nutritional status. **Purposes:** Our study aims to analyze the relationship between nutritional status and diarrhea in toddlers in the Pancoran Mas District Health Center. **Methods:** We used an observational analytic method with a cross-sectional approach on 396 toddlers aged 0 – 59 months. This research was conducted from October 2021 – March 2022. The type of data in this study is secondary data taken through medical records and analyzed using the chi-square test. **Result:** The prevalence of low-poor nutritional status was 38,9%, the prevalence of diarrhea was 21,2%, and the results of the chi-square analysis between diarrhea and nutritional status obtained p value = 0.334. **Conclusion:** Incidence of diarrhea in Depok City is still relatively large. There are many other factors that associated with the incidence of diarrhea such as personal hygiene, environmental hygiene and various other factors.

Keywords: diarrhea, nutritional status, toddlers

INTRODUCTION

One of the causes of increased morbidity and child mortality worldwide is diarrhea disease (1). In 2017, 525,000 toddlers aged < 5 years died from diarrhea yearly, or about 8% (2). The prevalence of diarrhea in Indonesia is 6.8%. One area in West Java Province, Depok, has a diarrhea incidence rate of 7.63%, and the number of sufferers ranks in the top 10 most diseases in 2020 (3).

Common signs of diarrhea are bowel movements with very short stools or stools with a frequency of more than three times a day (4). Diarrhea can result in dehydration due to fluid and electrolyte loss. Untreated dehydration in toddlers causes death due to diarrhea (2,5). Diarrhea has various risk factors in each area, such as low Healthy Behavior (6), lack of environment sanitation (7), poor clean water source (8), and low nutritional status (9). The toddler's nutritional status can be reviewed based on three indicators, namely weight for age (W/A), height for age (H/A), and weight for height (W/H). According to data from the Depok City Health Service (2020) there are 3,31% of children under five years have wasted nutritional status (3). The lower the nutritional status, the higher the risk of suffering from diarrhea. Low nutrition can reduce the body's immune reaction, which affects the body's resistance to exposure to microorganism infections in the digestive system (2,5,10).

One of the ways to prevent diarrhea in Indonesia is through activities and analysis of various factors for the incidence of

diarrhea in various regions. Based on the high incidence of diarrhea and low nutritional status in Depok City, the author is interested in conducting research related to the relationship between nutritional status and the incidence of diarrhea in toddlers aged 0 – 59 months at the Pancoran Mas District Health Center, Depok City for the period October 2021 – March 2022.

METHODS

The design of this study is an analytic survey with a cross-sectional approach. The study population was 1269 toddlers aged 0-59 months at the Pancoran Mas District Health Center, Depok City. Based on purposive sampling, it was found that the research sample was 396 toddlers (8).

The inclusion criteria for this study were toddlers aged 0 – 59 months (diarrhea or not) with height and weight data. The exclusion criteria for this study were toddlers who had congenital disorders history. Diarrhea diagnosis, height, and weight data toddlers were collected using secondary data from medical records for October 2021 – March 2022. The categorized nutritional status are divided into two groups: the first one is good-obese (WHZ ≥ -2 SD) and the second is low–poor (WHZ < -2 SD) (11,12). Characteristic of incidence of diarrhea are toddlers that have experienced diarrhea for less than 14 days (2,12). The bivariate chi-square test was used to analyze the relationship between nutritional status and incident of diarrhea, while fisher's exact test when the chi-square test did not qualify. The ethical commissions' Faculty of Medicine Universitas Muhammadiyah Prof. DR. HAMKA approved our study with protocols number are KEPKK/FK/019/ 12/2021.

RESULTS

The percentage group with low-poor nutritional status was 38.9%. The percentage of toddlers under five years with a history of diarrhea disease is 21.2%. An overview of the distribution characteristics of nutritional status and diarrhea incidence of toddlers under five years is presented in table 1.

Table 1. Frequency Distribution of Sample Characteristics

Characteristics	N	%
Nutritional Status		
Good – Obese	242	61.1
Low – Poor	154	38.9
Diarrhea Incidence		
Diarrhea	84	21.2
Non-diarrhea	312	78.8

The results of the distribution of 13 toddlers with diarrhea were the highest at the age of ≤ 24 months (57.1%). The sex frequency distribution of toddlers with the highest incidence of diarrhea was 57.1 % for male toddlers.

Table 2. Distribution of Characteristics of Toddlers with Diarrhea

Characteristics	Diarrhea Incidence	
	Diarrhea	
	N	%
Age		
≤ 24 months	48	57.1
>24 months	36	42.9
Sex		
Male	48	57.1
Female	36	42.9
Nutritional Status		
Good – Obese	47	56
Low – Poor	37	44

The results of the distribution of the nutritional status of toddlers with the highest incidence of diarrhea were toddlers with good – obese nutritional status,

totaling 47 toddlers (56%). The results of the distribution of toddlers with diarrhea and non-diarrhea are presented in table 2.

Analysis of the relationship between nutritional status and the incidence of diarrhea showed that toddlers with good – obese nutritional status with a percentage of 19.4% lower than those without diarrhea (80.6%). Toddlers with poor nutritional status have a history of diarrhea incidence, with a percentage of 24% lower than toddlers without diarrhea (76%). Based on the results, it was found that there was no relationship between nutritional status and the incidence of diarrhea, with a p-value of 0.334 (p-value > 0.05). The results of the bivariate analysis of nutritional status (W/H) and the incidence of diarrhea can be seen in table 3.

Table 3. Bivariate Analysis between Nutritional Status and the Incidence of Diarrhea

Nutritional Status (W/H)	Diarrhea incidence				p value
	Diarrhea		Non diarrhea		
	n	%	n	%	
Good–Obesity	47	19.4	195	80.6	
Low–Poor	37	24	117	76	0.334
Total	84	100	312	100	

DISCUSSION

The prevalence of toddlers under five years with low-poor nutritional status in the Pancoran Mas area, Depok City, which shows not yet reached the national target of alleviating low nutritional status below 7% (13). The prevalence of toddlers under five years with a history of diarrhea disease was higher than the incidence of diarrhea in 2020 (3). So, the diarrhea is still relatively large and can be a health problem in the Pancoran Mas area.

The distribution of characteristics of a toddler under five years who suffer from diarrhea with the highest percentage is 0 – 24 months. According to the theory, the lower the toddler's age, the more risk of diarrhea due to immature immune cells (14,15). The sex characteristics of toddlers who suffer from diarrhea are male. The Indonesian Ministry of Health states that the highest incidence of diarrhea in toddlers under five years is male. Characteristics of nutritional status were found in toddlers under five years with diarrhea, and the highest was in good nutritional status. These results are not in line with several studies which explain that low-poor nutritional status is more susceptible to diarrhea disease (16–18).

The chi-square analysis results showed no significant relationship between nutritional status and the incidence of diarrhea (p-value > 0.05). This study's results differ from another study in which there was a close relationship between nutritional status and the incidence of diarrhea (p = 0.001). Toddlers with good nutritional status have a history of diarrhea disease lower than toddlers without diarrhea (19). Another research stated that there is a correlation between nutritional status and diarrhea (p = 0.001) where toddlers with poor nutritional status suffer from diarrhea with a percentage of 10% compared to toddlers without diarrhea (7,20).

Low nutritional status caused a low immune system, decrease gastrointestinal innate immunity production, lymphocytes in Peyer's plaques, and IgA secretion to fight pathogens. In addition, low nutritional status can also affect the composition of the microbiota in the digestive tract (18,21). Microbiota worked in innate and adaptive immune regulation (22). Disturbance of the gut microbiota due to low nutritional status

causes decreased production of antibodies, some anti-inflammatory cytokines, and decreased pro-inflammatory cytokines (23). the intestine can become more susceptible to several pathogens, one of which is diarrhea (24). If diarrhea in toddlers occurs continuously and does not occur immediately given treatment, it will affect nutrient absorption (malabsorption) in the digestive tract, which leads to low nutritional status (25). So, the relationship between nutritional status and diarrhea can be two-way or like a vicious circle (26).

The weakness in this study was that the number of toddlers with diarrhea was less than the group without diarrhea. In addition, this study was only limited to the incidence of diarrhea which was reviewed by nutritional status. Another weakness in this study is that the data measurement only uses secondary data, so it cannot measure the immunity variable of the digestive system from each nutritional status of toddlers under five related to the incidence of diarrhea. In addition, this study's cross-sectional design could not explain a clear cause and effect between exposure and disease.

We suspect that factors other than nutritional status may be positively related to diarrhea in the Depok area, like drinking water sources. Drinking water sources are related to clean water quality according to microbial contamination level. If the source of clean water is not qualified, pathogen contamination inhibits the absorption process of nutrition in the body and causes digestive tract disorders such as diarrhea (2,5). Based on data from Depok City Health Service (2020), the percentage of clean water sources qualified in the Pancoran district is only 54.38%, that showed still lower than the national target of about 100% (3,27). So, it most likely may be related to one of the risk factors for diarrhea in the following research. The results of this study align with the research in Pamulang, which explained that nutritional status was not related to the incidence of diarrhea ($p = 0.425$). However, hand washing habits were positively associated with the incidence of diarrhea (28).

CONCLUSION

Diarrhea is a common infection among children, especially toddlers. Incidence of diarrhea in Depok City is still relatively large and can be a health problem in the Pancoran Mas area. Diarrhea and nutritional status had a close relationship with each other. Although, there are many other factors that associated with the incidence of diarrhea such as personal hygiene, environmental hygiene and various other factors.

ACKNOWLEDGMENTS

We want to thank Dr. dr. Wawang Setiawan Sukarya, Sp.OG(K), MARS, MH.Kes from Faculty of Medicine UHAMKA for the support of this study and also Pancoran Mas District Health Center, Depok City, for allowing us to conduct our data sampling.

CONFLICT OF INTEREST

The authors have no conflicts of interest to declare.

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