

Risk Factors Associated with the Prevalence of Diarrhea among Toddlers in the Catchment Area of Namang Primary Health Center

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ABSTRACT

Introduction: Diarrhea in children is still a major health problem and a leading cause of morbidity and mortality, especially in developing countries. The high incidence is influenced by factors such as nutritional status, dietary patterns, and caregiver knowledge, including in the Namang Community Health Center area.

Objective: This study aims to determine and analyze the association between nutritional status, dietary patterns, and caregiver knowledge as factors influencing the incidence of diarrhea among toddlers in the working area of the Namang Community Health Center in 2025.

Method: This study used a cross-sectional design with independent variables (nutritional status, diet, and knowledge) and dependent variable (diarrhea incidence). The population size in this study was 375 people, and a sample of 87 people was calculated using random sampling.

Result: The results of the study, using the Chi-Square statistical test, yielded a p-value of $0.000 < 0.05$ for nutritional status, $0.000 < 0.05$ for dietary patterns, and $0.000 < 0.05$ for knowledge. This indicates a significant relationship between nutritional status, dietary patterns, and knowledge and the incidence of diarrhea in toddlers in the Namang Community Health Center work area in 2025.

Conclusion: The recommendations in this study are expected to serve as evaluation material for the importance of support from health workers in the diarrhea treatment process. This should be a focus for health institutions in designing broader work programs that will impact recovery, particularly diarrhea in toddlers.

Keywords: diet, diarrhea incidence, knowledge, nutritional status

Introduction

Diarrhea in children is a condition in which a child experiences an increase in the number of bowel movements due to a digestive tract disorder. The stool consistency is watery and liquid (contains a lot of fluid) and usually occurs more than three times in 24 hours. Diarrhea is a common symptom of gastrointestinal infections caused by various pathogens, including bacteria, viruses, and protozoa. Diarrhea is more common in developing countries due to a lack of clean drinking water, sanitation, and poorer nutritional status. According to the latest available figures, an estimated 2.5 billion people lack adequate sanitation facilities, and nearly one billion people lack access to clean drinking water. This unhealthy environment allows diarrhea-causing pathogens to spread more easily (Cairo, 2020).

According to the World Health Organization (WHO), diarrhea is a leading cause of death in children, killing approximately 760,000 children annually worldwide, with 1.7 billion children under 5 years of age affected by diarrhea. Diarrhea in children is caused by bacterial infections, malnutrition, unsanitary water sources, and a lack of knowledge about diarrhea prevention. Untreated diarrhea can lead to severe dehydration and significant fluid loss, leading to child mortality (WHO, 2022).

Basic Health Research (Riskesmas) data indicates that the prevalence of diarrhea in children in Indonesia is 6.7%. The five provinces with the highest diarrhea incidence are Aceh (10.2%), Papua (9.6%), DKI Jakarta (8.9%), South Sulawesi (8.1%), Banten (8.0%), and North Sumatra (4.5%). The highest prevalence of diarrhea in toddlers and preschoolers is found in the 1-5 age group (7.6%), boys (5.5%), and girls (4.9%). Based on data and information from the Indonesian health profile in 2020, the highest morbidity rate among hospitalized individuals in Indonesia is 10.3%, followed by pneumonia (9.4%), and dengue fever (3.8%). Diarrhea cases in Indonesia remain quite high. In 2020, the incidence of diarrhea among all ages was 270 per 1,000 population, while the incidence among toddlers was 847 per 1,000 population (Riskesmas, 2023).

Data from the Bangka Belitung Health Office showed that in 2022, 39,521 cases of diarrhea were reported in children. In 2023, this number increased to 39,701 cases, and in 2024, it reached 39,817 cases. Based on the above data, diarrhea cases in children in Bangka Belitung Province have been increasing annually (Bangka Belitung Provincial Health Office, 2025).

Data from the Central Bangka Regency Health Office shows that diarrhea cases have been increasing annually. Data from 2022 showed 5,250 cases of diarrhea in children, 5,403 in 2023, and 5,704 in 2024. Based on the above data, diarrhea cases in children in Bangka Belitung Regency have increased each year (Bangka Belitung Regency Health Office, 2025). Data on the incidence of diarrhea in toddlers in the Namang Community Health Center (Puskesmas) work area has increased in the last three years. In 2022, the number of diarrhea cases in toddlers was 88 cases, in 2023 there were 92 cases and in 2024 there was an increase of 104 cases (Reikam Meidis Puskesmas Namang, 2025).

The results of the research conducted by Ningsih et al. (2023) stated that the results of the chi-square statistical test showed that there was a correlation between dietary patterns and diarrhea in toddlers (p -value $0.044 < 0.05$). Diarrhea can be caused by unhealthy eating patterns, namely infectious and non-infectious factors. In the case of toddler diarrhea caused by infection, there are microorganisms such as viruses, bacteria, and parasites that enter the toddler's body. Non-infectious factors that can cause diarrhea include contaminated food or drinks. Microorganisms that cause diarrhea are usually found in the oral cavity. Living microorganisms that enter the intestinal mucosa are susceptible to gastric acid resistance.

These microorganisms multiply in the intestinal mucosa and produce toxins. These toxins stimulate the growth of intestinal mycoses and cause hyperpyretic acid secretion in the intestinal mucosa, thus minimizing the incidence of diarrhea (Ningsih et al., 2023).

A study conducted by Itamingtyas et al. (2021) also stated that the chi-square test results showed a correlation between respiratory depression and diarrhea in toddlers at the Riyadi Anak Hospital in 2020 with a P value of $0.024 < 0.05$. Diarrhea is a serious condition that requires rapid and effective intervention. Diarrhea should be avoided to address the effects of diarrhea, including dehydration and malnutrition. Diarrhea can be prevented by minimizing breast milk, giving oral rehydration salts or salt-free solutions to replace lost fluids, and giving solid foods to infants. Provide regular diarrhea and avoid foods containing sodium. Give zinc supplements for 10 days. Avoid giving antidiarrheal medications to children, as they can inhibit the growth of kidney stones (Itamingtyas et al., 2021).

Based on the results of the survey conducted on 29 September 2025 on 10 respondents in the Kirja Piskismas Namang area, it was shown that 7 people (70%) did not recognize the early symptoms that occurred in their children. Children who did not receive nutritious food intake and had nutrition that was less than the standard of nutrition, many children had dry skin, small pyrites and small eyes, as many as 6 people (60%). The unhealthy eating patterns of children who did not eat vegetables, fruits, meat, eggs, did not pay attention to the food given to children and bought unhygienic food from the wild were as many as 7 people (70%). By Karina Iti, the Intik Tirtarik Research Center provides static guidance on nutrition, diet and warnings regarding daily events in children.

Objective

This study aims to determine and analyze the association between nutritional status, dietary patterns, and caregiver knowledge as factors influencing the incidence of diarrhea among toddlers in the working area of the Namang Community Health Center in 2025.

Method

This study employed an analytic observational design using a cross-sectional approach to examine the relationship between nutritional status, diet, and knowledge as independent variables and diarrhea incidence as the dependent variable. The study population consisted of mothers with toddlers aged 1–5 years who received health services in the working area of the Namang Community Health Center in 2024, with a total population of 375 respondents. The minimum required sample size was calculated using a probability sampling formula and resulted in 79 respondents. To anticipate possible non-response or incomplete data, an additional ten percent was added to the calculated sample, resulting in a final sample size of 87 respondents. Sampling was conducted using a simple random sampling technique so that each eligible respondent had an equal probability of being selected, following the methodological guidance of Sugiyono (2022).

Eligibility criteria included mothers or primary caregivers with children aged 1–5 years who received treatment at the health center, toddlers who had a history of diarrhea within the last six months, and respondents who were willing to participate and able to provide informed consent. Respondents were excluded if they declined participation, were unable to communicate verbally or in writing, or submitted incomplete data.

Result

Table 1. Relationship between Nutritional Status and Diarrhea Incidence

Nutritional Status	Diarrhea Incidence				Total		p-value	Correlation Coefficient
	Diarrhea		Not Diarrhea		n	%		
	n	%	N	%				
Malnutrition	3	100	0	0	3	100	0.000	0.625
Undernutrition	40	80	10	20	50	100		
Good Nutrition	1	3	30	96	31	100		
Overnutrition	3	100	0	0	3	100		
Total	47	54	40	46	87	100		

Based on Table 1 The results showed that 40 respondents (80%) experienced diarrhea and had poor nutritional status, more than those with diarrhea and poor nutritional status, good nutritional status, and better nutritional status. Meanwhile, 30 respondents (96.8%) did not experience diarrhea and had good nutritional status, more than those without diarrhea and poor nutritional status, poor nutritional status, and better nutritional status.

The Spearman's α test showed a significance value of $0.000 < 0.05$, indicating a significant relationship between nutritional status and diarrhea incidence. The correlation coefficient value is 0.625 (0.51-0.75), indicating a very strong relationship between the two variables, nutritional status, and diarrhea incidence.

Table 2. The Relationship between Dietary Patterns and Diarrhea Incidence

Dietary Pattern	Diarrhea Incidence				Total		p-value	POR (CI 95%)
	Diarrhea		Not Diarrhea		n	%		
	n	%	n	%				
Unhealthy	39	86.7	6	13.3	45	100	0.000	27.625 (8.711-87.602)
Healthy	8	19	34	81	42	100		
Total	47	54	40	46	87	100		

Table 2 shows that 39 respondents experienced diarrhea and had unhealthy diets. (86.7%), more than the 8 respondents who experienced diarrhea and had a healthy diet (19%). Meanwhile, the 34 respondents (81%) who did not experience diarrhea and had a healthy diet were more than the 6 respondents who did not experience diarrhea and had an unhealthy diet (13.3%). The significance value in the Chi-Square Test was $0.000 < 0.05$. This indicates that there is a significant relationship between diet and the occurrence of diarrhea. POR value (CI 95%) = 27.625 (8.711-87.602) which means that the risk of unhealthy eating patterns is 27.625 times greater than the risk of experiencing diarrhea.

Table 3. The Relationship between Knowledge and Diarrhea Incidence

Knowledge	Diarrhea Incidence				Total		p-value	POR (CI 95%)
	Diarrhea		Not Diarrhea		n	%		
	n	%	n	%				
Poor	38	79.2	10	20.8	48	100	0.000	12.667
Good	9	23.1	30	76.9	39	100		(4.568-
Total	47	54	40	46	87	100		35.122)

Table 3 shows that respondents who experienced diarrhea and had knowledge The number of respondents with poor knowledge was 38 (79.2%), more than the number of respondents who experienced diarrhea and had good knowledge (9 people) (23.1%). Meanwhile, the number of respondents who did not experience diarrhea and had good knowledge was 30 (76.9%), more than the number of respondents who did not experience diarrhea and had poor knowledge (10 people) (20.8%).

The significance value in the Chi-Square Test was $0.000 < 0.05$. This indicates that there is a significant relationship between knowledge and the occurrence of diarrhea. POR value (CI 95%) = 12.667 (4.568-35.122) which means that the risk of being less well informed has a 12.667 times greater risk of experiencing diarrhea.

Discussion

The research results showed that 40 (80%) respondents experienced diarrhea and had poor nutritional status, outnumbering those with diarrhea and poor nutritional status, good nutritional status, and better nutritional status. Meanwhile, 30 (96.8%) respondents did not experience diarrhea and had good nutritional status, outnumbering those without diarrhea and poor nutritional status, poor nutritional status, and better nutritional status.

The Spearman's test showed a significance value of $0.000 < 0.05$, indicating a significant relationship between nutritional status and diarrhea incidence. The correlation coefficient value is 0.625 (0.51-0.75), indicating a very strong relationship between the two variables, nutritional status, and diarrhea.

This supports the researcher's assumption that nutritional status significantly influences the incidence of diarrhea, especially in toddlers. Poor nutritional status in toddlers will disrupt the balance between nutrient consumption and absorption, as well as nutrient utilization. This can increase the risk of diarrhea in toddlers. Adequate nutrition is essential for optimal immune function in the body, enabling toddlers to fight various diseases, especially diarrhea. The research results showed that 39 (86.7%) respondents experienced diarrhea and had an unhealthy diet, compared to 8 (19%) respondents who experienced diarrhea and had a healthy diet. Meanwhile, 34 (81%) respondents did not experience diarrhea and had a healthy diet, compared to 6 (13.3%) respondents who did not experience diarrhea and had an unhealthy diet.

The Chi-Square test showed a significance value of $0.000 < 0.05$. This indicates a significant relationship between diet and diarrhea incidence. POR value (CI 95%) = 27.625 (8.711-87.602) which means that the risk of unhealthy eating patterns is 27.625 times greater than the risk of experiencing diarrhea. This is a scientific assumption that parents should know that good eating patterns are given to children, especially toddlers. A healthy eating pattern will affect the toddler's immune system and affect the risk of the toddler suffering from various types of diseases, especially diarrhea. Meanwhile, parents who provide good dietary

habits, such as paying attention to nutrition, protein, and food hygiene when serving to children, will improve their immune systems, thus preventing diarrhea. The research results showed that 38 respondents (79.2%) experienced diarrhea and had poor knowledge, compared to 9 respondents (23.1%) who experienced diarrhea and had good knowledge. Meanwhile, 30 respondents (76.9%) did not experience diarrhea and had good knowledge, compared to 10 respondents (20.8%).

The Chi-Square test showed a significant correlation of $0.000 < 0.05$. This indicates a significant relationship between knowledge and diarrhea. The POR (95% CI) value was 12.667 (4.568-35.122), meaning respondents with poor knowledge were 12.667 times more likely to experience diarrhea. The researcher's assumption is that a person's knowledge underlies the actions that a person will take. Mother's knowledge regarding diarrhea indicates her ability to know or understand the problem of diarrhea, including understanding, causes of diarrhea, classification of diarrhea, symptoms and signs of diarrhea, pathophysiology of diarrhea and its prevention. One of the important factors in the initial treatment of diarrhea in toddlers is mother's knowledge. Mother's knowledge can influence a person's behavior towards behavior both directly and indirectly. Knowing the mother's understanding, causes, symptoms, treatment and proper prevention of diarrhea in toddlers is very important in reducing the incidence of diarrhea.

Conclusion

There were significant relationships between nutritional status, dietary patterns, and knowledge and the incidence of diarrhea among toddlers in the working area of the Namang Community Health Center.

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Authors' contribution

Each author contributed equally in all the parts of the research. All authors have critically reviewed and approved the final draft and are responsible for the content and similarity index of the manuscript.

Conflict of interest

The authors declare that there is no conflict of interest regarding the publication of this paper. This research was conducted independently without any financial, commercial, or personal relationships that could be construed as a potential conflict of interest. All processes, including study design, data collection, analysis, and manuscript preparation, were carried out objectively and without external influence.

Ethical consideration

Not applicable.

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