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Association Between Exclusive Breastfeeding and Maternal Knowledge of Toddler Nutrition with Wasting Incidence in Toddlers

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ABSTRACT

Introduction: Wasting is an acute nutritional disorder in toddlers that can lead to impaired growth and increased morbidity. Exclusive breastfeeding and maternal knowledge about toddler nutrition are key factors influencing nutritional status. This study aims to examine the association between exclusive breastfeeding and maternal knowledge of nutrition with the incidence of wasting among toddlers in the working area of Sidomulyo Health Center, Samarinda City.

Methods: This study employed a quantitative analytical method with a cross-sectional design. A total of 188 mothers and toddlers were sampled using stratified random sampling, and 168 toddlers met the inclusion criteria for analysis. Data were collected through structured questionnaires and anthropometric measurements. The Chi-Square test was used to analyze the association between variables, and odds ratios (OR) were calculated to determine risk levels.

Results: Among the 168 toddlers, 43 (25.6%) were identified as experiencing wasting. A significant association was found between exclusive breastfeeding and wasting incidence (p = 0.000; OR = 0.111; 95% CI = 0.049–0.255), indicating that children who were not exclusively breastfed had a higher risk of wasting. Maternal knowledge of toddler nutrition also showed a significant relationship with wasting (p = 0.000), where poor maternal knowledge was associated with a higher incidence of wasting.

Conclusion: Exclusive breastfeeding and good maternal knowledge about toddler nutrition are protective factors against wasting. Health promotion strategies at the community health center level should prioritize increasing awareness and education regarding exclusive breastfeeding and toddler nutritional needs to reduce the prevalence of wasting.

Keywords: exclusive breastfeeding, maternal knowledge, toddler nutrition, wasting

Introduction

Wasting, or acute malnutrition, remains a critical public health concern that significantly threatens the health and survival of children under five. According to the World Health Organization (WHO), wasting is defined as low weight-for-height, with a Z-score of less than -2 standard deviations (SD), and reflects either recent and severe weight loss or failure to gain weight, which can lead to severe acute malnutrition (Purwadi et al., 2023; Nasution et al., 2024). Globally, this condition affects an estimated 45 million children under five, as reported by WHO in 2022. In Indonesia, data from the 2022 Indonesian Nutritional Status Survey (SSGI) revealed a national prevalence of wasting at 7.7%, indicating that this problem is widespread and persistent.

At the local level, the city of Samarinda reported a prevalence of wasting of 12.7% across 26 community health centers (Muawwanah, 2024). Notably, one of the highest rates was observed at the Sidomulyo Health Center, which reported a prevalence of 20.56% in 2024 (Uga & Wisnuwardani, 2025). These figures highlight the urgent need for targeted interventions, as the incidence at Sidomulyo exceeds both local and national averages. Although other forms of malnutrition such as stunting and overweight are also global priorities—with 148.1 million and 37.0 million affected children respectively according to WHO (2022)—this study focuses specifically on wasting due to its acute and life-threatening nature, particularly at the study location.

Multiple factors are known to influence the occurrence of wasting. Among these, exclusive breastfeeding and maternal knowledge about toddler nutrition have been frequently identified as significant determinants of nutritional status (Anggreni, 2022). Exclusive breastfeeding for the first six months of life provides optimal nutrition and immune protection, and it is endorsed by the Indonesian government through Law No. 36 of 2009 and the Ministry of Health (2023). Breast milk contains a balanced composition that supports early growth and development, and its exclusive provision without the introduction of water or solid foods has been shown to reduce the risk of malnutrition and infection.

In addition to breastfeeding practices, maternal knowledge about nutrition plays a critical role in shaping children's dietary habits and overall nutritional status. Mothers who are knowledgeable about the principles of toddler nutrition, including balanced energy and nutrient requirements, are better equipped to make informed food choices that ensure adequate intake of carbohydrates, proteins, fats, vitamins, and minerals (Puspasari in Jannah, 2023; Fadmi et al., 2024). According to Ahmad et al. (2024), balanced nutrition for children aged 1–3 years includes 1,350 kcal per day, with 20 g of protein, 45 g of fat, and 215 g of carbohydrates, in addition to sufficient fiber and fluids. When maternal knowledge is limited, there is a higher likelihood of poor feeding practices, leading to nutritional imbalances that may result in conditions such as wasting (Anggraeni et al., 2023; Fuada et al., 2023).

Wasting not only increases a child's susceptibility to infection and mortality but also poses long-term consequences for cognitive development and educational attainment. Children who suffer from wasting during the first two years of life are particularly at risk of permanent brain damage and reduced human capital potential (UNICEF, 2023). Therefore, understanding the relationship between exclusive breastfeeding, maternal knowledge, and the incidence of wasting is essential for informing public health strategies.

Given the high prevalence of wasting in the Sidomulyo Health Center and the known importance of breastfeeding and maternal education, this study aims to analyze the relationship between exclusive breastfeeding and maternal knowledge of toddler nutrition

with the incidence of wasting in children aged 12–36 months. The findings are expected to support the development of targeted health education and nutritional intervention programs to reduce the burden of wasting in the region.

Objective

This study employed a quantitative analytical method with a cross-sectional design. A total of 188 mothers and toddlers were sampled using stratified random sampling, and 168 toddlers met the inclusion criteria for analysis. Data were collected through structured questionnaires and anthropometric measurements. The Chi-Square test was used to analyze the association between variables, and odds ratios (OR) were calculated to determine risk levels.

Method

This study employed a quantitative correlational research design with a cross-sectional approach to determine the relationship between exclusive breastfeeding and maternal knowledge of toddler nutrition with the incidence of wasting among children. A cross-sectional design allows for the simultaneous collection of data on independent and dependent variables (Adiputra et al., 2021), and was deemed appropriate for assessing associations at a single point in time (Afandi, 2020).

The study population comprised all toddlers aged 2–5 years and their mothers who visited the Posyandu (integrated health service posts) within the Sidomulyo Health Center working area in Samarinda Ilir District in 2024. A total population of 353 toddlers across seven Posyandu was recorded. The sampling technique used was stratified purposive sampling, and the final sample size of 188 toddlers was calculated using the Slovin formula, ensuring representative distribution from each Posyandu. The research was conducted in seven Posyandu: Anggrek, Flamboyan, Kenari, Lestari 1, Setia, Sri Rejeki, and Teratai.

To ensure sample relevance, inclusion criteria included toddlers aged 2–5 years, those with a complete Maternal and Child Health (KIA) book, and mothers willing to participate in the study. Exclusion criteria were toddlers residing in orphanages, those absent during data collection, and those suffering from chronic illnesses requiring ongoing medical care (Nursalam, 2020).

The primary data collection tool was a structured questionnaire assessing exclusive breastfeeding practices and maternal knowledge about toddler nutrition. Prior to data collection, the instrument was tested for validity and reliability. Validity testing was conducted at Posyandu Rumbia II in Samarinda Ilir on 30 respondents using biserial correlation with the Guttman scale. The results showed that 10 out of 15 items had a Pearson correlation coefficient greater than the critical value ($r > 0.361$), indicating sufficient validity (Djaali, 2020). Reliability testing was conducted using the Kuder-Richardson Formula 20 (KR-20), yielding a coefficient of 0.755, which exceeds the minimum standard of 0.70, indicating that the instrument is reliable (Djaali, 2020).

Data were collected via direct interviews with mothers using the validated questionnaire. Anthropometric measurements of the toddlers were conducted to assess their nutritional status, particularly the presence of wasting (defined as a weight-for-height Z-score between -3 and -2 SD).

For data analysis, a univariate analysis was first conducted to determine the frequency distribution of each variable. Percentages were calculated using the formula:

$$\frac{f}{n} x\ 100\%$$

where **p** represents the percentage being sought, **f** denotes the frequency of responses or cases for each specific question or category, and **n** refers to the total number of respondents or samples. This formula allows for a clear depiction of the distribution of each variable in percentage terms, facilitating easier interpretation and comparison of the data across different groups or categories.

Bivariate analysis was then carried out using the Chi-square test to examine the relationship between exclusive breastfeeding, maternal nutritional knowledge, and the incidence of wasting. This statistical test is appropriate for evaluating the association between categorical variables on an ordinal scale (Hidayat, 2021).

Result

In this chapter, the results of the study on the relationship between exclusive breastfeeding and maternal knowledge about toddler nutrition in the Sidomulyo Health Center, Samarinda City will be discussed. The research data were collected using a questionnaire as an instrument, which was carried out from October to December. In addition, this chapter also presents an overview of the research location and the results of data analysis, which include univariate and bivariate analysis.

General Overview of Research Location

The Anggrek, Flamboyan, Kenari, Lestari 1, Setia, Sri Rejeki, Teratai integrated health posts are integrated health posts located in the Sidomulyo Health Center Working Area. The Sidomulyo Health Center is located on Jelawat Street Gang.6, Sidodamai, Samarinda Ilir District, Samarinda City, East Kalimantan.

Respondent Characteristics

Table 1 presents the demographic and health-related characteristics of 168 toddlers and their mothers in the Sidomulyo Health Center working area. Among the toddlers, 57.1% were female and 42.9% male, with the majority (56%) aged between 3.1–4 years. Most mothers were aged 21–35 years (82.7%), had an education level of elementary to high school (91.1%), and primarily worked as housewives (76.2%). Regarding feeding practices, 57.7% of toddlers were exclusively breastfed. In terms of maternal knowledge about toddler nutrition, 50.6% had sufficient knowledge, while 45.8% had good knowledge. Lastly, 25.6% of the toddlers experienced wasting, while 74.4% did not, indicating that the majority were in a healthy nutritional state.

Table 1. Respondent Characteristics

Characteristics	Frequency (n)	Percentage (%)
Toddler Gender		
Male	72	42.9
Female	96	57.1
Toddler Age		
2–3 years	40	23.8
3.1–4 years	94	56.0
4.1–5 years	34	20.2

Mother's Age		
<20 years	8	4.8
21–35 years	139	82.7
>35 years	21	12.5
Education		
Elementary–High School	153	91.1
D3–Bachelor	15	8.9
Occupation		
Housewife	128	76.2
Businesswoman	23	13.7
Private Sector	5	3.0
Civil Servant	12	7.1
Breastfeeding		
Exclusive Breastfeeding	97	57.7
Non-Exclusive Breastfeeding	71	42.3
Knowledge	77	45.8
Good		
Enough	85	50.6
Not Enough	6	3.6
Wasting incidence		
Wasting	43	25.6
No Wasting	125	74.4

Bivariate analysis was conducted to test the significance of the relationship between the independent variables, namely Exclusive Breastfeeding and Mother's Knowledge of Toddler Nutrition with the dependent variable Wasting Incident. In this study, the chi-square test was used, as can be seen in the following table.

Table 2. Analysis of the Relationship between Exclusive Breastfeeding and Wasting Incidence in Toddlers

	Wasting Incident					
	No Wasting		**Waste**		***P***	**OR**
	n	%	n	%	***Value***	
Exclusive Breastfeeding	88	90.7%	9	9.3%	0,000	0.111
Non-Exclusive Breastfeeding	37	52.1%	34	47.9%		(CI 95%= 0.049-0.255)
Total	**125**	**74.4%**	**43**	**25.6**		

The analysis results from Table 7 show that out of 168 toddlers who were respondents, there were 97 toddlers who received Exclusive Breast Milk, while 71 toddlers received Non-Exclusive Breast Milk. Of the 97 toddlers who received Exclusive Breast Milk, 88 toddlers (90.7%) did not experience wasting. On the other hand, out of 71 toddlers who received Non-Exclusive Breast Milk, 34 toddlers (47.9%) experienced wasting.

Statistical test using Chi-Square Test produces p-value 0.000, which is smaller than p (0.05). This indicates that H0 is rejected and Ha is accepted, which means there is a significant relationship between Exclusive Breastfeeding and wasting. Toddlers who receive Exclusive

Breastfeeding have the same risk as toddlers who receive Non-Exclusive Breastfeeding to experience wasting (OR = 0.111; 95% CI = 0.049-0.255).

Table 3. Analysis of the Relationship between Mothers' Knowledge of Toddler Nutrition and the Incidence of Wasting in Toddlers

	Waste			No Wasting			P Value
	n	Expect Count	%	n	Expect Count	%	P Value
Good	6	19.7	7.8	71	57.3	92.2	0,000
Enough	34	21.8	40.0	51	63.2	60.0	
Not enough	3	1.5	50.0	3	4.5	50.0	
Total	**43**	**43.0**	**25.6**	**125**	**125.0**	**74.4**	

The results of the analysis of table 3.7 show that out of a total of 168 respondents, 43 children experienced wasting. Among these children, 6 children (7.8%) came from mothers with good nutritional knowledge. Meanwhile, 34 children (40.0%) came from mothers with sufficient nutritional knowledge. There were 50.0% of children with poor maternal knowledge who experienced wasting, although only 3 children from this group. On the other hand, out of 125 children who did not experience wasting, 71 children (92.2%) came from mothers who had good knowledge. These results show the importance of maternal nutritional knowledge in preventing wasting in children. From the results of the statistical test using Fisher's Exact Test which was applied as an alternative, it produced a p-value which was also very significant, namely (p = 0.000). This test is more appropriate to use in situations of low expected frequency, thus providing more reliable results. Thus, Fisher's Exact Test provides stronger confirmation of the relationship between maternal knowledge and wasting in children.

Discussion

This study found a notable association between exclusive breastfeeding, maternal knowledge about toddler nutrition, and the incidence of wasting among children aged 2–5 years in the Sidomulyo Health Center working area, Samarinda. The findings are consistent with global and national evidence that wasting continues to be a significant public health issue with multifactorial causes, including nutritional practices and caregiver knowledge.

In terms of respondent characteristics, the majority of toddlers were female, with most falling in the age range of 37.2 to 48 months. Rahmawati et al. (2024) noted that approximately 45% of deaths among children under five are due to malnutrition, highlighting the critical role of nutrition during the golden age of development. Malnutrition during this sensitive period can impair both physical and cognitive growth, and predispose children to long-term health complications. Sayafraini et al. (2022) reported that male toddlers may face greater nutritional risks due to their higher biological energy and nutrient needs during early development. This disparity can be compounded by external factors such as parental feeding practices and environmental conditions, emphasizing the need for targeted nutritional attention for boys.

From the maternal perspective, most respondents were within the productive age range of 21–35 years, had elementary to high school educational backgrounds, and were primarily

housewives. The mother's age during pregnancy is an influential factor in child health outcomes. Pusmaika et al. (2022) found that pregnancies occurring at a risky age (under 20 or over 35 years) are associated with a higher likelihood of delivering children with nutritional deficiencies, including wasting. In addition, maternal education plays a central role in nutrition-related decision-making. Mothers with higher education levels are generally more receptive to health information and more capable of implementing appropriate feeding practices, as supported by Sitanggang and Wardana (2021). Conversely, low maternal education often correlates with insufficient knowledge about proper child nutrition, increasing the risk of undernutrition in children. This emphasizes the necessity of community-level education to improve nutritional literacy among mothers.

Regarding exclusive breastfeeding, this study found that the majority of toddlers (n=91) received exclusive breastfeeding, while 71 received non-exclusive breastfeeding. According to Rahma et al. (2024), breast milk offers an ideal nutritional composition that supports optimal infant growth and development. Exclusive breastfeeding for the first six months is particularly important as it provides all the essential nutrients infants require, without exposing them to inappropriate complementary foods or fluids. Furthermore, breast milk enhances immune function and protects against infections, which can otherwise compromise nutritional status. The present findings reinforce the protective role of exclusive breastfeeding against wasting and highlight the need for health education programs to promote and support exclusive breastfeeding practices among mothers.

In terms of maternal knowledge about toddler nutrition, this study revealed that a majority of mothers (n=77) demonstrated good nutritional knowledge. Maternal knowledge is a significant determinant of child nutritional status. Polin et al. (2024) emphasized that inadequate maternal knowledge, along with inappropriate parenting styles and frequent infections, contributes substantially to wasting. Hawazen et al. (2024) also underscored the critical role of maternal understanding in the selection and preparation of nutritionally adequate foods for toddlers. Therefore, mothers with greater knowledge are more likely to implement balanced diets that meet their children's dietary needs, thereby reducing the likelihood of malnutrition.

The incidence of wasting among the study population was 25.6% (43 out of 168 toddlers). This aligns with findings from Halimah et al. (2024), who identified exclusive breastfeeding and maternal knowledge as significant determinants of wasting. Ilham & Amelia (2024), as well as Fitri et al. (2024), also confirmed that exclusive breastfeeding contributes to the prevention of wasting. Similarly, studies by Rahmawati et al. (2022) and Perdana, Maimunah & Hilmi (2024) highlighted maternal knowledge as a crucial factor. While maternal knowledge is a major contributor, Polin et al. (2024) noted that additional elements—such as infections and poor parenting—also influence wasting outcomes. Thus, it is reasonable to assume that wasting is a multifactorial issue shaped by exclusive breastfeeding practices, maternal nutritional knowledge, maternal age, health service access, and household socioeconomic conditions.

Statistical analysis demonstrated a significant relationship between exclusive breastfeeding and the incidence of wasting, with a p-value of 0.000. Toddlers who were exclusively breastfed had a markedly lower risk of wasting, with an odds ratio (OR) of 0.111, indicating they were 88.9% less likely to be wasted compared to those who were not exclusively breastfed (95% CI: 0.049–0.255). These results are consistent with Hidayat et al. (2020), Ilham & Amelia (2024), and Fitri et al. (2024), who confirmed similar associations. However, it should be noted that exclusive breastfeeding alone does not entirely prevent

wasting. In some cases, children who received exclusive breastfeeding still experienced wasting due to inadequate nutrient intake during the weaning period or the presence of infections, as also discussed by Soedarsono & Sumarmi (2021). Therefore, exclusive breastfeeding must be followed by appropriate complementary feeding and continued health monitoring.

Furthermore, the analysis revealed a statistically significant relationship between maternal knowledge and wasting incidence ($p = 0.000$). Mothers with better knowledge were more likely to have children with normal nutritional status. This supports findings from Halimah (2024), Rahmawati et al. (2022), and Perdana, Maimunah & Hilmi (2024), who emphasized that informed mothers are more capable of fulfilling their children's nutritional requirements. Education appears to be a key factor influencing nutritional knowledge (Polin et al., 2024). Consequently, interventions aimed at increasing maternal education, particularly regarding child feeding practices, may be an effective strategy for reducing wasting prevalence.

In summary, this study indicates that both exclusive breastfeeding and maternal knowledge are critical protective factors against wasting. However, these should be considered within a broader framework of health promotion that also addresses parenting practices, food security, infectious disease prevention, and access to health services. A multifaceted approach is needed to effectively combat acute malnutrition and improve child health outcomes in high-risk communities such as Sidomulyo.

Conclusion

This study underscores the critical connection between exclusive breastfeeding and maternal knowledge of toddler nutrition with the risk of wasting in children. Sociodemographic profiles suggest that maternal age, education, and occupation may play influential roles in toddler health outcomes. Exclusive breastfeeding and strong maternal knowledge were found to be key protective factors against wasting. These findings highlight the importance of community-based health education and breastfeeding support programs to empower mothers with the knowledge and practices necessary to prevent malnutrition and promote optimal toddler development.

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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 researchers stated that there is no conflict of interest related to the implementation and publication of the results of this research. The entire research process, from planning, data collection, analysis, to report preparation, was carried out independently without any influence or pressure from any third party. A commitment to research ethics is upheld throughout the research process, ensuring transparency, accuracy and honesty in reporting results. Respondents' participation was voluntary with informed consent, and their confidentiality and privacy were maintained in accordance with applicable research ethics

standards. With this statement, researchers hope that the research results can be trusted and used as a valid reference for the development of science and health practices related to ethnomedicine and reproductive health.

Ethical consideration

Not applicable.

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References

1. Ahmad, A., Nur, A., Muliadi, T., Marissa, N., Naufal, I., Marisa, M., ... & Annisa, D. (2024). Factors associated with stunting among children 0-23 months in Aceh: A cross-sectional study using SSGI 2021. *AcTion: Aceh Nutrition Journal, 9*(3), 538-547. https://doi.org/10.30867/action.v9i3.1824
2. Ara, G., Fawad, B., & Shabbir, S. (2024). Malnutrition in children under five years in a squatter settlement of Karachi: a case-control study. *BMC Public Health, 24*(1), 848. https://doi.org/10.1186/s12889-024-18359-3
3. Djaali, H. (2020). Quantitative Research Methodology. Jakarta: PT Bumi Aksara.
4. Fadmi, F. R., Kuntoro, K., Otok, B. W., Melaniani, S., & Mulyani, S. (2024). Predictors of stunting, wasting, and being underweight in Indonesia: A literature review. *African journal of reproductive health, 28*(10), 358-367.
5. Fuada, N., Salimar, S., & Setyawati, B. (2023). Characteristics of Acute and Chronic Nutritional Status of Toddlers. CV. Prosperous Young Feniks.
6. Hidayat, AA (2021). Developing research instruments & validity-reliability tests. Surabaya: Health Books Publishing.
7. Hidayat, AA (2021). Practical ways of statistical testing with SPSS. Health Books Publishing.
8. Ilham, M., & Amelia, R. (2024). Analysis of Risk Factors for Stunting Among Toddlers Aged 24-59 Months in the Working Area of Cibodasari Puskesmas Community Health Center, Tangerang City. *International Journal on ObGyn and Health Sciences, 2*(2), 89-100. https://doi.org/10.35335/obgyn.v2i2.159
9. Jannah, M. (2023). Nutritional Status of Toddlers: Its Relationship With Employee Knowledge, Attitudes and Actions. CV DOTPLUS Publisher.
10. Muawwanah, S. (2024). Model Optimasi SVM-GSBE dalam Menangani High Dimensional Data Stunting Kota Samarinda. https://dspace.umkt.ac.id//handle/463.2017/4656
11. Nasution, Risfah Afni Zakiah, Sofya Maya, and Yanti Ernalia. “Hubungan Pengetahuan Gizi Ibu, Asupan Energi dan Protein Dengan Kejadian Wasting Pada Balita di Kelurahan Pasar Sibuhuan: The Correlation Between Maternal Nutritional Knowledge, Energy Intake And Protein With Wasting In Pasar Sibuhuan Village.” *Prosiding Seminar Nasional Integrasi Pertanian dan Peternakan*. Vol. 2. No. 1. 2024. https://semnasfpp.uin-suska.ac.id/index.php/snipp/article/view/101
12. Perdana, D. A., Maimunah, S., & Hilmi, M. A. (2024). Relationship Between Nutritional Status With The Development of Toddlers (Age 1-5 Years) in The Work Area of The Candi Sidoarjo Community Health Center. *Global Ten Public Health and Nursing Journal, 2*(2), 29-38. https://doi.org/10.36568/gtphnj.v2i2.142

13. Purwadi, H.N., Nurrika, D., Wulandari, M., Novrinda, H., & Febriyanti, H. (2023). Determinants of Wasted Among Age 6-59 Months: The Indonesia Family Life Survey 2014. Amerta Nutrition, 7(1SP), 17–24. https://doi.org/10.20473/amnt.v7i1SP.2023.17-24.
14. Uga, M. A., & Wisnuwardani, R. W. (2025). Pemetaan Prevalensi dan Faktor Risiko Stunting Berbasis Sistem Informasi Geografis di Kota Samarinda Tahun 2024. Preventif Journal, 9(2). 125-137.
15. UNICEF Indonesia. (2023). In Addition to Stunting, Wasting is Also a Form of Child Nutrition Problem That Needs to Be Watched Out For.
16. UNICEF. (2021). The Crisis of Children's Diets in Early Life 2021 Child Nutrition Report. www.unicef.org
17. WHO. (2023). Levels and Trends in Child Malnutrition.