Journal of Public Health and Pharmacy
ISSN: 2775-4952
Website: https://jurnal.unismuhpalu.ac.id/index.php/jphp

The Relationship Between Children's Health Status and Stunting in Toddlers at Mamboro Health Center, Palu

Ketut Suarayasa[1]*, Miranti[2], Bertin Ayu Wandira[3]
[1]Departement of Public Health Sciences and Community Medicine, Faculty of Medicine, Tadulako University Palu, Sulawesi Tengah, Indonesia, suarayasa@yahoo.com
[2]Departement of Public Health Sciences and Community Medicine, Faculty of Medicine, Tadulako University Palu, Sulawesi Tengah, Indonesia, myraumar20@gmail.com
[3]Health Policy Adminstration section, Faculty of Public Health, Tadulako University Palu, Sulawesi Tengah, Indonesia, bertinayuwandira76@gmail.com

***Corresponding Author**: E-mail: suarayasa@yahoo.com

ARTICLE INFO

Received: 17 March, 2024
Revised: 28 June, 2024
Accepted: 8 July, 2024
Volume: 4
Issue: 2
DOI: 10.56338/jphp.v4i2.5123

KEYWORDS

Child Health Status
Exclusive Breastfeeding
History of Infectious Diseases
Stunting

ABSTRACT

Introduction: Taipa Sub-District in Palu City has a high prevalence of stunting, with 24.7% or 108 cases out of 437 toddlers measured. This makes Taipa, located in the Mamboro Health Center area, the sub-district with the highest stunting cases in Palu City. This research aims to analyze the relationship between children's health status (exclusive breastfeeding, colostrum feeding, frequency of breastfeeding, and history of infectious diseases) and the incidence of stunting in the Mamboro Health Center working area.
Methods: This quantitative study uses a case-control design to determine the magnitude of risk factors related to children's health status and the incidence of stunting in toddlers within the Mamboro Health Center working area. The total sample comprised 204 toddlers, including 102 stunted toddlers (cases) and 102 normal toddlers (controls).
Results: There is a significant relationship between exclusive breastfeeding and a history of infectious diseases with the incidence of stunting in toddlers ($p<0.05$). Mothers who do not provide exclusive breastfeeding have a 2.2 times higher risk of their children being stunted (OR = 2.225). Children who have experienced infectious diseases have a 1.9 times higher risk of becoming stunted (OR = 1.944). However, the frequency of breastfeeding and colostrum feeding did not show a significant relationship with stunting among toddlers in the Mamboro Health Center working area.
Conclusion: The child's health status factors that are significantly related to the incidence of stunting include exclusive breastfeeding and a history of infectious diseases. These findings highlight the need for interventions promoting exclusive breastfeeding and effective management of infectious diseases to reduce stunting rates in this area.

Publisher: Pusat Pengembangan Teknologi Informasi dan Jurnal Universitas Muhammadiyah Palu

INTRODUCTION

Stunting is the most common form of child malnutrition with an estimated 161 million children worldwide experiencing stunting in 2013 (1). In 2017, 22.2% or around 150.8 million children under five in the world experienced stunting. More than half of the stunted toddlers in the world come from Asia (55%) while more than a third (39%) live in Africa (2).

According to the 2019 Indonesian Toddler Nutrition Status Survey (SSGBI), the prevalence of stunting in Indonesia decreased to 27.7%. This reduction indicates that approximately one in four children under the age of

five, totaling over eight million children across the country, are affected by stunting. Despite this decline, the stunting rate remains alarmingly high when compared to international and national benchmarks. The World Health Organization (WHO) has set a threshold of 20% for stunting prevalence, while Indonesia has set an ambitious national target to reduce the rate to 14% by 2024. Achieving this target will require concerted efforts to address the underlying causes of stunting, including improving maternal and child nutrition, enhancing healthcare services, and addressing socio-economic factors that contribute to malnutrition (3).

Data from the 2021 Indonesian Nutritional Status Study reveals that the prevalence of stunting (height-for-age) among children under five in Central Sulawesi remains significantly high. Central Sulawesi is among the top ten provinces with the highest stunting rates in Indonesia, ranking eighth with a prevalence rate of 29.7%, considerably above the national average of 24.4% (4).

The 2022 Indonesian Nutrition Status Survey (SSGI) indicates that the stunting rate in Palu City has risen to 24.7%, a 0.7% increase from the 2021 rate of 23.9%. Taipa Sub-District, within the Mamboro Health Center area, stands out with a particularly high prevalence of stunting, affecting 24.7% of its toddler population, equating to 108 cases out of 437 measured. This makes Taipa the sub-district with the highest incidence of stunting in Palu City (5).

While several studies have examined the impact of exclusive breastfeeding and infectious diseases on stunting, there is limited research focusing on the combined effect of these factors within specific communities such as Mamboro. Furthermore, the roles of colostrum feeding and breastfeeding frequency remain less explored, particularly in the context of Central Sulawesi.

This study aims to analyze the relationship between various aspects of children's health status—including exclusive breastfeeding, colostrum feeding, frequency of breastfeeding, and history of infectious diseases—and the incidence of stunting among toddlers in the Mamboro Health Center working area. By addressing this gap, the study seeks to provide insights that could inform public health strategies to reduce stunting in similar high-prevalence areas.

METHOD

This research is a quantitative research using a case control study design (6) to determine the magnitude of the risk factors for children's health status on the incidence of stunting in toddlers in the Mamboro Health Center working area. Data was taken based on data on stunted toddlers at each Posyandu in the Mamboro Health Center working area. There are 13 Posyandu in the Mamboro Health Center working area with a total of stunted toddlers as many as 102 toddlers (as cases). With a ratio of 1:1, 102 toddlers were not stunted (control) with the criteria of being in the same posyandu area as the stunted toddlers.

Data collection was carried out by researchers assisted by 20 enumerators who were cadres from 13 posyandu research locations. Before collecting data, training was conducted for 20 enumerators.

The collected data was computerized and analyzed using univariate and bivariate analyses. Univariate analysis is used to describe each variable and produce frequency and percentage distributions for each variable. Bivariate analysis was carried out in two stages which were thought to be related or correlated. To prove whether there is a relationship, a chi-square statistical test was carried out with a confidence level of 95% ($\alpha = 0.05$). Because the research design was case control, the researchers also carried out an Odds Ratio analysis, namely the comparison of exposure between the case group to exposure in the control group (7).

RESULTS

Respondent Characteristics

The respondents of this study were mothers of stunted toddlers (cases) and mothers of non-stunted toddlers (controls). Most of the case and control respondents were aged between 20 – 35 years and came from Posyandu Anggrek. This shows that stunting cases are quite high in the Anggrek Posyandu area.

Table 1. Characteristics of Respondents in the Case and Control Groups in the Mamboro Health Center Area, Palu City, 2023

Variable	Case		Control	
	n	(%)	N	(%)
Age Group				
< 20 years	2	2.0	6	5.8
20 - 35 years	70	68.6	67	65,7
> 35 years	30	29.4	29	28,5
Total	102	100.0	102	100.0
Integrated Healthcare Center				
Ketapang	12	11.8	12	11.8
Lentora	7	6.9	7	6.9
Flamboyan	11	10.8	11	10.8
Anggrek	29	28.4	29	28.4
Ratora	13	12.7	13	12.7
Beringin	3	2.9	3	2.9
Asoka	4	3.9	4	3.9
Mekar	3	2.9	3	2.9
Rosela	4	3.9	4	3.9
Teratai	1	1.0	1	1.0
Bugenvil	2	2.0	2	2.0
Bayu Permai	6	5.9	6	5.9
Kemuning	7	6.9	7	6.9
Total	102	100.0	102	100.0
Parity				
<=2 Child	32	31.4	58	56.9
>2 Child	70	68.6	44	43.1
Total	102	100.0	102	100.0
Age of first pregnancy				
< 20 years	32	31.4	27	10.8
20 – 35 years	69	67.6	75	15.7
>35 years	1	1,0	10	9.8
Total	102	100.0	102	100.0
Child's age				
0-12 months	6	5.9	18	17.6
13-24 months	21	20.6	19	18.6
25-36 months	30	29.4	28	27.5
37-48 months	28	27.5	21	20.6
49-60 months	10	9.8	14	13.7
>60 months	7	6.9	2	2.0
Total	102	100.0	102	100.0
Child's gender				
Man	57	55.9	57	55.9
Woman	45	44.1	45	44.1
Total	102	100.0	102	100.0
Birth weight				
Low birth weight	28	27.5	14	13.7
Not low birth weight	74	72.5	88	86.3
Total	102	100.0	102	100.0

Source: Primary Data, 2023

The data above shows that the characteristics of respondents in the case group and control group are largely the same. Except for parity, where the majority of the case group had parity > 2 children (68.6%) compared to the control group with parity > 2 children, only 43.1%.

Child Health Status

What was studied regarding the child's health status included: exclusive breastfeeding, colostrum feeding, frequency of breastfeeding and history of infectious diseases. The results are as follows:

Table 2. Description of the Health Status of Children in the Case and Control Groups in the Mamboro Health Center Area, Palu City, 2023

Variable	Nutritional Status			
	Stunting (Case)		Not Stunted (Control)	
	n	%	n	%
Breastfeeding				
Non-exclusive breastfeeding	65	63,7	45	44,1
Exclusive breastfeeding	37	36,3	57	55,9
Total	102	100,0	102	100,0
Colostrum feeding				
No	21	20,6	19	18,6
Yes (first 3 days)	81	79,4	83	81,4
Total	102	100,0	102	100,0
Frequency of breastfeeding				
Not enough	20	19,6	21	20,6
Often (every time you cry)	82	80,4	81	79,4
Total	102	100,0	102	100,0
History of infectious disease				
Ever (within 3 months)	75	73,5	60	58,8
Never (within 3 months)	27	26,5	42	41,2
Total	102	100,0	102	100,0

Source: Primary Data, 2023

Data in table 2 shows that normal toddlers receive more exclusive breastfeeding (55.9%) than stunting toddlers (36.3%). Stunted toddlers experience infectious diseases more often (73.5%) than non-stunting toddlers (58.8%).

The relationship between children's health status and the incidence of stunting

There are several factors that play a role in maintaining a child's health status, including: exclusive breastfeeding, colostrum feeding, frequency of breastfeeding and a history of infectious diseases in children. Of these factors, it turns out that not all of them are related to the incidence of stunting, as in the table below.

Table 3. Relationship Between Children's Health Status and the Incidence of Stunting in the Mamboro Health Center Area, Palu City, 2023

Variable	Nutritional Status					
	Stunting (Case)		Not Stunted (Control)			
	n	%	n	%	***p value***	**OR (95% CI Lower - Upper)**
Breastfeeding						
Non-exclusive breastfeeding	65	63,7	45	44,1		
Exclusive breastfeeding	37	36,3	57	55,9		**2,225**
Total	102	100	102	100	**0,005**	**(1,2 – 3,9)**
Colostrum feeding						
No	21	20,6	19	18,6		
Yes (first 3 days)	81	79,4	83	81,4		**1,133**
Total	102	100	102	100	**0,724**	**(0,4 – 1,8)**
Frequency of breastfeeding						
Not enough	20	19,6	21	20,6		
Often (every time you cry)	82	80,4	81	79,4		**1,133**
Total	102	100	102	100	**0,861**	**(0,4 – 1,8)**

History of infectious disease						
Ever (within 3 months)	75	73,5	60	58,8		
Never (within 3 months)	27	26,5	42	41,2		**1,944**
Total	102	100	102	100	**0,026**	**(1,0 – 3,5)**

Source: Primary Data, 2023

From the data in table 3, it can be seen that what is related to the incidence of stunting is exclusive breastfeeding and a history of infectious diseases (p value <0.05). Mothers who do not provide exclusive breastfeeding have a 2.2 times risk of giving birth to stunted children (OR = 2.225) and children who have experienced infectious diseases have a 1.9 times risk of becoming stunted toddlers (OR = 1.944).
The colostrum feeding factor and the frequency of breastfeeding were not related to the incidence of stunting in the Mamboro Health Center area (p value> 0.05).

DISCUSSION

The results show that what is associated with the incidence of stunting is exclusive breastfeeding and a history of infectious diseases (p value <0.05). Mothers who do not provide exclusive breastfeeding have a 2.2 times risk of giving birth to stunted children (OR = 2.225) and children who have experienced infectious diseases have a 1.9 times risk of becoming stunted toddlers (OR = 1.944).

Exclusive breastfeeding coverage in this study was 36.3% (case group) and 55.9% (control group). This figure is still far below the 2018 Riskesdas, namely 74.5% of mothers in Indonesia provide exclusive breastfeeding. Several previous studies showed different results from this study (8)(9).

Analysis of 2010 and 2013 Riskesdas data on children aged 12-23 months did not show a relationship between exclusive breastfeeding and stunting (p = 0.147). A longitudinal study in Bogor did not show an association between exclusive breastfeeding and stunting (HR 1.45; 95% CI 0.92 – 2.29). The same findings were also reported in a case control study in Kalimantan (OR 0.18; p = 0.042). However, several large-scale studies were still able to find a protective relationship between exclusive breastfeeding and stunting. In-depth analysis is needed to examine breast milk quality factors that cause this relationship to not be found in some populations (10)(11).

In general, nutritional status is directly influenced by food intake. So, the food given to children must be adequate in terms of quantity and quality of food. The quantity in question includes the number or portion of food and the frequency of feeding. The quality in question is like the variety of food (12)(13). The frequency of food required by a child to achieve the recommended energy intake depends on the energy density of the food. Children who are no longer breastfed need food frequently and in larger quantities, paying special attention to the quality of protein, micronutrients and energy from food (14)(15).

The variable history of exclusive breastfeeding has a significant relationship with the incidence of stunting, but the frequency of giving it has no relationship. There are several cases where after the mother feels that her child is full, she stops breastfeeding (8)(16). Apart from that, when the mother gives birth, the baby's IMD (Early Initiation of Breastfeeding) time is not quite one hour. The World Health Organization (WHO) and UNICEF cited by Maryunani (2012) stated that the IMD time for a baby after birth is one hour to obtain colostrum which is yellow and contains lots of antibodies. Therefore, colostrum feeding is very important for the baby's immunity. However, the results of this study show that there is no relationship between colostrum feeding and the incidence of stunting (p value> 0.05). Colostrum feeding and the frequency of breastfeeding have an effect on improving the immune system and health of toddlers, but do not directly affect the incidence of stunting (17).

Breastfeeding for 15 minutes, if breast milk production is sufficient and the milk comes out smoothly, is enough for the baby. It is said that the amount of breast milk the baby sucks in the first 5 minutes is ±112 ml, the second 5 minutes is ±64 ml and the last 5 minutes is only ±16 ml. Several researchers suspect that the effect of exclusive breastfeeding on stunting does not come from the aspect of nutritional intake, but rather from efforts to prevent infectious diseases. Another related theory is a model from experts which shows that exclusive breastfeeding alone will not be able to reduce the incidence of stunting, but must be supported by improvements in socioeconomic conditions, education levels, infectious disease problems, and women's empowerment. This

statement is relevant to the research results, which found a relationship between a history of infectious diseases in toddlers and the incidence of stunting at the Mamboro Health Center (p-value < 0.05).

Previous studies have also indicated that dietary habits and family income significantly influence malnutrition outcomes in children. For instance, a study in Makassar City found a strong relationship between diet quality, family income, and the nutritional status of toddlers (18). Similarly, a study conducted in Ghana reported that lower family income was significantly associated with higher odds of child malnutrition (adjusted OR, 2.73) compared to higher family income groups (19). These findings highlight the need for a holistic approach that considers both health practices and socioeconomic determinants to effectively address stunting.

Further, research conducted during the COVID-19 pandemic demonstrated that reduced staple food consumption in households significantly increased the prevalence of child malnutrition (20). This underscores the impact of economic and environmental disruptions on children's nutritional status, reinforcing the importance of stable and sufficient food supplies for preventing malnutrition.

Future research should explore these additional factors and consider longitudinal designs to better understand causal relationships. It is crucial to investigate how integrated health interventions and socioeconomic support can synergistically reduce stunting rates. By addressing these broader determinants, public health strategies can be more comprehensive and impactful in improving child health outcomes.

CONCLUSION

Children's health status, especially exclusive breastfeeding and history of infectious diseases, is significantly related to stunting. Mothers who do not provide exclusive breastfeeding have a 2.2 times higher risk of their children being stunted, and children with a history of infectious diseases have a 1.9 times higher risk. Colostrum feeding and breastfeeding frequency were not significantly associated with stunting.

To address these issues, it is important to promote exclusive breastfeeding through health campaigns and education for new mothers. Preventing and managing infectious diseases in children should also be a priority, which includes improving access to vaccinations, clean water, and sanitation, and educating parents about hygiene. Community health programs can support mothers and families by providing regular health check-ups, nutritional counseling, and breastfeeding support groups. Addressing socioeconomic factors is also crucial, such as providing financial support, improving healthcare access, and enhancing maternal education.

Further research should explore other factors influencing stunting, like dietary diversity and maternal health during pregnancy. Long-term studies could offer deeper insights into these issues. By implementing these suggestions, policymakers and healthcare providers can develop better strategies to reduce stunting and improve child health outcomes.

AUTHOR'S CONTRIBUTION STATEMENT

This research was conducted by the research team with specific contributions as follows: 1) Coordination with the health department and community health centers for data collection: Ketut Suarayasa; 2) Development of questionnaires and enumerator training: Miranti; 3) Data collection and analysis: Bertin Ayu Wandira.

CONFLICTS OF INTEREST

The authors declare no conflicts of interest.

SOURCE OF FUNDING STATEMENTS

This research was funded by the Institute for Research and Community Service (LPPM) Tadulako University, Palu.

ACKNOWLEDGMENTS

We express our gratitude to the Head of the Palu City Health Service, the Head of the Mamboro Community Health Center, Posyandu cadres, and the mothers of toddlers who provided data. Special thanks to the leadership of Tadulako University for their support.

BIBLIOGRAPHY

1. UNICEF Indonesia. Laporan Tahunan 2021 UNICEF Indonesia. United Nations Child Fund World Trade Cent 2. 2022;16–16.
2. WHO. Childhood Stunting: Context, Causes and Consequences - Conceptual framework. 2020;9(September).
3. Kemenkes. Hasil Survei Status Gizi Indonesia (SSGI) 2022. 2023;1–7.
4. Dinkes Provinsi Sulteng. Profil Kesehatan Provinsi Sulawesi Tengah. Profil Kesehat Provinsi Sulawesi Teng. 2021;1–222.
5. Dinas Kesehatan Kota Palu. Profil Dinas Kesehatan Kota Palu. 2021. 1–23 p.
6. Yokokawa H. Introduction of case-control study. Juntendo Univ Sch Med. 2014;5:1–29.
7. Alexander LK, Lopes B, Ricchetti-Masterson K, Yeatts KB. Case-Control Studies Second Edition Authors. Gillings Sch Glob Public Heal [Internet]. 2015;6.
8. Sarwinanti, Andriyani K. Risk factors for stunting in toddler. Int J Adv Sci Technol [Internet]. 2020;29(9 Special Issue):432–40.
9. Kemenkes RI. Riset Kesehatan Dasar. Survei Demografi dan Kesehatan Indonesia 2017. 2018.
10. Rahayu A, Yulidasari F, Putri AO, Anggraini L. Study Guide - Stunting dan Upaya Pencegahannya. Buku stunting dan upaya pencegahannya. 2018. 88 p.
11. Candra MKes(Epid) DA. Pencegahan dan Penanggulangan Stunting [Internet]. Epidemiologi Stunting. 2020. 1–53 p.
12. Titaley CR, Ariawan I, Hapsari D, Muasyaroh A. Determinants of the Stunting of Children in Indonesia : A Multilevel Analysis of the 2013 Indonesia Basic Health Survey. Nutrients. 2013;11:1160.
13. Adriani Merryana dan Wirjatmadi Bambang. Gizi dan Kesehatan Balita. Kharisma Putra Utama. 2014;
14. Mohammed SH, Muhammad F, Pakzad R, Alizadeh S. Socioeconomic inequality in stunting among under-5 children in Ethiopia: A decomposition analysis. BMC Res Notes [Internet]. 2019;12(1):1–5.
15. Suarayasa K, Sugiharto J, Saragih S, Aristyanita V, Wandira BA. Analysis of egg consumption in palu and sigi district communities. Int J Pharm Res. 2020;13(1):572–8.
16. Nirmalasari NO. Stunting Pada Anak : Penyebab dan Faktor Risiko Stunting di Indonesia. Qawwam J Gend Mainstreming. 2020;14(1):19–28.
17. Brigitte SR. Hubungan Status Gizi Dengan Kejadian Stunting. Hub Pola Asuh dengan Kejadian Stunting Anak Usia 6-23 Bulan di Wil Pesisir Kec. 2013;3(1):155–64.
18. Kartini. Relationship between Diet and Family Income with Malnutrition in Toddlers in the Working Area of Mamajang Health Center, Makassar City. J. Public Heal. Pharm. [Internet]. 2021Jul.25 [cited 2024Jun.28];1(2):30-3. Available from: https://jurnal.unismuhpalu.ac.id/index.php/jphp/article/view/3715
19. BMC Public Health. Maternal profiles and social determinants of malnutrition and the MDGs: What have we learnt? BMC Public Health. 2021 [cited 2024 Jun 27]. Available from: https://bmcpublichealth.biomedcentral.com/articles/10.1186/s12889-021-10353-6.
20. Frontiers. The relationship between family diet consumption, family environment, parent anxiety and nutrition status children during the COVID-19 pandemic: a longitudinal study. Frontiers. 2021 [cited 2024 Jun 27]. Available from: https://www.frontiersin.org/articles/10.3389/fnut.2021.645564/full