Healthy Tadulako Journal (Jurnal Kesehatan Tadulako)
Vol. 11 No.3 July 2025
P-ISSN : 2407-8441/e-ISSN : 2502-0749

Original Research Paper

The Relationship Between History of Infectious Diseases and Immunization Status With Stunting Incidence in Toddlers Aged 24-59 Months at the Tamalate Health Center, Makassar City in 2024

Regita Dian Adiesta[1], Masita Fujiko M.Said[2]*, Andi Millaty Halifah Dirgahayu Lantara[3], Muh. Alfian Jafar[4], Abdi Dwiyanto Putra Samosir[4]

[1]*Faculty of Medicine, Universitas Muslim Indonesia*
[2]*Department of Obstetrics and Gynecology, Faculty of Medicine, Universitas Muslim Indonesia*
[3]*Department of Physiology, Faculty of Medicine, Universitas Muslim Indonesia*
[4]*Department of Pediatrics, Faculty of Medicine, Universitas Muslim Indonesia*

Access this article online
Quick Response Code :

DOI :
https://doi.org/10.22487/htj.v11i3.1678

Email Corresponding:
masitafujikom.said@umi.ac.id

Page : 377-383

Article History:
Received: 2024-12-05
Revised: 2025-06-11
Accepted: 2025-07-30

Published by:
Tadulako University,
Managed by Faculty of Medicine.

Website :
https://jurnal.fk.untad.ac.id/index.php/htj/index

Abstract

Background: Stunting remains a major nutritional problem in Indonesia, affecting not only children's physical growth but also cognitive development, academic performance, susceptibility to degenerative diseases, and future productivity. Addressing stunting is therefore essential to improve human resources quality. **Objective:** This study aimed to analyze the relationship between history of infectious diseases and immunization status with the incidence of stunting in toddlers aged 24–59 months at Tamalate Health Center, Makassar City, in 2024**. Methods:** This was a quantitative study using an observational analytic method with a cross-sectional design. A total of 68 stunted toddlers were included using purposive sampling. Data collected covered age, sex, nutritional status, history of acute respiratory infections (ARI), diarrhea, and immunization status**. Results:** Most stunted toddlers were aged 24–35 months (41.2%), female (51.5%), short stature (83.8%), had a history of ARI (58.8%), no history of diarrhea (83.8%), and incomplete immunization (54.6%). Statistical analysis showed no significant association between history of ARI (p=0.174), diarrhea (p=0.124), or immunization status (p=0.096) and stunting incidence**. Conclusion:** History of infectious diseases and immunization status were not significantly related to stunting incidence in toddlers aged 24–59 months at Tamalate Health Center, Makassar.

Keywords: *History of infection, Immunization status, Stunting.*

Introduction

The golden age period is a unique phase in human life development, defined as the "Golden Age" because the approximately 100 billion brain cells are primed to receive stimuli, enabling optimal intelligence development. This golden age occurs during the first 1000 days of a child's life, calculated from conception until approximately 2 years of age. This period can also be interpreted as a critical window that impacts a child's growth, development, and cognition [1–3].

Stunting is defined as short or very short stature based on length/height-for-age below -2 standard deviations (SD) on the WHO growth curve, resulting from irreversible conditions due to inadequate nutritional intake and/or recurrent/chronic infections occurring during the first 1000 days of life. Common signs include decreased growth velocity in children, especially toddlers [4,5].

According to global stunting prevalence data collected by WHO, in 2020, 22% or approximately 149.2 million toddlers worldwide experienced stunting. Based on Indonesia's National Nutrition Status Survey (SSGI) in 2022, stunting prevalence was 21.6%. This figure decreased from 24.4% the previous year. Despite the decline, this rate remains high, considering the 2024 national

stunting target of 14% and the WHO standard below 20%. Stunting prevalence in South Sulawesi reached 27.2% in 2022, ranking 10th highest in Indonesia. The province reduced stunting by only 0.2 percentage points from 27.4% in 2021 [6,7].

Stunting causes long-term impacts including impaired physical, mental, intellectual, and cognitive development. Children stunted by age 5 become difficult to rehabilitate, leading to persistence into adulthood and increased risk of low-birth-weight offspring. Toddlers over two years with stunting struggle to catch up in growth [8–10].

Recent studies show stunted children exhibit poor school performance, lower educational attainment, and reduced adult income. Stunted children are more likely to become unhealthy, impoverished adults. Stunting also increases children's vulnerability to infectious and non-communicable diseases (NCDs), as well as risks of overweight and obesity, which long-term increase degenerative disease risks [5,11].

Stunting causes are grouped into direct and indirect factors. Direct factors include prolonged inadequate nutrient intake, maternal health during pregnancy/delivery/postpartum, unsuccessful exclusive breastfeeding and complementary feeding practices, and childhood infectious diseases. Indirect factors include low economic status affecting food access/availability, sanitation/environmental health, and social factors influencing lifestyle, culture, parenting patterns, and healthcare access [7,12,13].

This study holds high urgency as stunting prevalence in South Sulawesi, including Makassar City, remains above national targets and WHO standards despite declines. The complexity of stunting determinants particularly infectious disease history and immunization status requires in-depth investigation, especially in urban settings like Tamalate Health Center facing unique public health challenges. This research offers novelty by integrating these two variables to understand their contribution to stunting in toddlers aged 24-59 months. Findings are expected to provide robust scientific evidence supporting more effective, context-specific stunting reduction strategies in Makassar and South Sulawesi generally.

Materials and Methods

Study Design

This quantitative study employed an observational analytic method with a cross-sectional design to simultaneously examine independent variables (history of infectious diseases and immunization status) and the dependent variable (stunting incidence), enabling prevalence assessment and variable relationships.

Sample

Samples were selected using purposive sampling with inclusion/exclusion criteria ensuring only stunted toddlers aged 24–59 months meeting eligibility requirements were included. Based on stunted toddler visit data at Tamalate Health Center in 2024 and Slovin's formula with 5% error margin, 68 toddlers were sampled.

Data Collection Techniques

Data collection commenced after obtaining official permission from the Tamalate Health Center head. Data were sourced from medical records and direct respondent interviews. Processing involved SPSS version 25 through editing, coding, entry, and cleaning to ensure validity and consistency.

Data Analysis Techniques

Univariate analysis described respondent characteristics and variable distributions. Bivariate analysis tested relationships between independent variables (infectious disease history and immunization status) and the

dependent variable (stunting incidence) using Chi-Square tests with 0.05 significance level.

Ethical Consideration

The study adhered to health research ethics principles, including informed consent, respondent identity confidentiality, and data use solely for research purposes. Research permission was obtained from Tamalate Health Center, with all respondents receiving explanations prior to data collection.

Result

This study analyzed characteristics of stunted toddlers and evaluated relationships between infectious disease history, immunization status, and stunting incidence. Analysis involved 68 toddlers using primary/secondary data covering age, sex, nutritional status, infectious disease history, and immunization status. The study aims to provide in-depth insights into potential stunting factors and support more effective prevention/intervention efforts.

Table 1. Frequency Distribution of Respondent Characteristics

Variable	Frequency (n)	Percentage (%)
Age		
24-35 Months	28	41.2
36-47 Months	25	36.8
48-59 Months	15	22.1
Sex		
Female	35	51.5
Male	33	48.5
Stunting Severity		
Short	57	83.8
Very Short	11	16.2
ARI History		
Yes	40	58.8
No	28	41.2
Diarrhea History		
Yes	11	16.2
No	57	83.8
Immunization Status		
Complete	31	45.6
Incomplete	37	54.5
Total	68	100.0

Source: *Secondary data, 2024*

Based on Table 1 analysis, most stunted toddlers were aged 24-35 months (41.2%). Females predominated (51.5%) over males (48.5%). For nutritional status, 57 toddlers (83.8%) had short stature, while 11 (16.2%) were very short. Most stunted toddlers had ARI history (40 toddlers, 58.8%), while 28 (41.2%) did not. Regarding diarrhea history, the majority (83.8%) had no history, while 16.2% had experienced diarrhea. For immunization status, 37 toddlers (54.5%) had incomplete immunization, while 31 (45.6%) were fully immunized. These characteristics provide considerations for further stunting analysis.

Based on Table 2 analysis, bivariate test results showed most toddlers with ARI history had short stature stunting (31 toddlers, 77.5%), while very short stunting occurred in 9 toddlers (22.5%). However, statistical testing showed no significant association between ARI history and stunting ($p = 0.174$). For diarrhea history, most toddlers without diarrhea history had short stature stunting (50 toddlers, 87.7%), while only 7 (63.6%) with diarrhea history were stunted. Statistical analysis also showed no significant association between diarrhea history and stunting ($p = 0.124$). Similarly, for immunization status, fully immunized toddlers predominantly had short stature stunting (29 toddlers, 93.5%), yet the relationship between immunization status and stunting was statistically insignificant ($p = 0.096$). These results indicate none of the three variables had significant associations with stunting incidence in this study's toddler population.

Discussion

Relationship Between Infectious Disease History and Stunting Incidence

Based on ARI history analysis with stunting incidence, stunted toddlers with short stature more frequently had ARI history (31 individuals, 77.5%) compared to very short stature (9 individuals, 22.5%). Chi-Square test results showed significance (P-Value) of $0.174 > \alpha = 0.05$. Thus, statistically, no significant association exists between ARI history and stunting incidence.

Similarly, diarrhea history analysis showed stunted toddlers with short stature more

frequently had diarrhea history (7 individuals, 63.6%) compared to very short stature (4 individuals, 36.4%). Chi-Square test results showed significance (P-Value) of 0.124 > α = 0.05. Thus, statistically, no significant association exists between diarrhea history and stunting incidence.

Table 2. Bivariate Analysis Results for Stunting Incidence

Variable	Stunting Incidence		Total	Statistical Test
	Short n (%)	Very Short n (%)	n (%)	
ARI History				
Yes	31 (77.5)	9 (22.5)	40 (100)	p = 0,174
No	26 (92.9)	2 (7.1)	28 (100)	
Diarrhea History				
Yes	7 (63.6)	4 (36.4)	11 (100)	p = 0,124
No	50 (87.7)	7 (12.3)	57 (100)	
Immunization Status				
Complete	29 (93.5)	2 (6.5)	31 (100)	p = 0,096
Incomplete	28 (75.7)	9 (24.3)	37 (100)	
Total	57 (83.8)	11 (16.2)	68 (100)	

Source: *Primary and secondary data, 2024*

These findings align with Sahitarani et al. (2020), which found no association between infectious disease history and stunting in children aged 24-59 months in Sedayu District, Bantul Regency, with statistical results of p=0.094 for ARI-stunting and p=0.555 for diarrhea-stunting. Similarly, Rahmawati et al. (2020) found no significant association between infectious disease history and stunting in Sawah Besar District (p=0.348).

This study found no significant relationship between infectious disease history (ARI or diarrhea) and stunting. Although some research indicates children with infectious disease histories are more vulnerable to stunting, infectious diseases generally result from poor hygiene/sanitation practices. Recurrent infections can reduce children's appetite and impair nutrient absorption during digestion. Prolonged illness indirectly causes inadequate nutrient intake, leading to weight loss and stunting [14,15].

Infectious diseases must be prevented promptly to minimize stunting risks. This study identified some stunted children without infectious disease histories, possibly due to effective and timely disease management that did not affect nutritional intake or immune systems. This indicates not all children with infectious disease histories develop stunting[16].

Easy access to primary healthcare facilities at the research site may explain the lack of association between infectious disease history and stunting. Reduced infection duration correlates with healthcare access when disease management is effective, including better-trained health practitioners, efficient referral systems, and health promotion for home-based infection management[15].

However, infectious diseases may still relate to stunting. This aligns with Ndagijimana S. et al. (2022), showing diarrheal and parasitic infections are significant stunting risk factors[17].

The cross-sectional design limitation prevents establishing causal relationships between disease history and outcomes, relying solely on maternal recall of children's health over the past three months.

Relationship Between Immunization Status and Stunting Incidence

Based on immunization status analysis with stunting incidence, stunted toddlers with short stature more frequently had complete

immunization (29 individuals, 93.5%) compared to very short stature (2 individuals, 6.5%). Chi-Square test results showed significance (P-Value) of 0.096 > α = 0.05. Thus, statistically, no significant association exists between immunization status and stunting incidence.

These findings align with Sutriyawan et al. (2020), which found no association between immunization status and stunting in Citarip Health Center's working area, Bandung City (p=0.056). Similarly, Vasera (2023) at Sungai Aur Health Center, West Pasaman, West Sumatra (p=0.12) found no significant association between immunization and stunting.

In this study, most respondents did not receive complete immunization. One reason for low coverage is mothers' inadequate knowledge about child immunization. Results showed 54.5% of stunted toddlers had incomplete immunization, as recorded in Maternal and Child Health (MCH) books where immunization was missed during certain months due to fever or referrals to Integrated Management of Childhood Illness (IMCI) rooms. Theoretically, inadequate immunization weakens children's immune systems, increasing infection susceptibility. Unmanaged infections elevate stunting risks [18].

Some studies show fully immunized toddlers more frequently avoid stunting than those with incomplete immunization. However, incompletely immunized toddlers appear in both normal and stunted groups, while fully immunized toddlers also experience stunting. These findings contradict Agustia et al. (2018), identifying incomplete immunization as a stunting risk factor in toddlers aged 12-59 months in Tambang Poboya, Palu City [19].

Literature reviews on basic immunization status show more studies reporting no significant association between complete basic immunization and stunting. This may occur because immunization is not a primary stunting factor. Immunization aims to reduce infection incidence in children, indirectly relating to stunting [20].

Immunization goals include reducing illness, death, and disability from vaccine-preventable diseases in childhood. Immunization indirectly addresses stunting by reducing recurrent infections, especially in children with inadequate nutrition. Unimmunized children become vulnerable to specific diseases, potentially causing nutritional status decline. Therefore, basic immunization and toddler nutrition fulfillment continue to be promoted per government programs to address infectious diseases and prevent growth failure, including stunting[20,21].

Conclusion

Based on research results regarding infectious disease history and immunization status relationships with stunting incidence in toddlers aged 24-59 months at Tamalate Health Center, Makassar City (2024), it is concluded that infectious disease history and immunization status are not significant risk factors for increased stunting incidence in this age group. No significant associations exist between infectious disease history, immunization status, and increased stunting incidence in toddlers aged 24-59 months at Tamalate Health Center, Makassar City.

Future research should expand variable coverage, including parenting patterns, parental education, economic status, nutritional intake, and environmental sanitation, which may show stronger stunting associations. Sample sizes and research coverage areas should increase to enhance result generalizability. Longitudinal designs can monitor toddler development continuously, while disease history and immunization data should be analyzed more detailedly, covering types, durations, and immunization schedule compliance. Combining quantitative and qualitative methods can provide deeper insights into

parental perceptions and stunting prevention practices. Additionally, collaboration with healthcare workers can help understand immunization program implementation, infection control, and more effective stunting interventions.

Acknowledgment

The authors express profound gratitude to Allah SWT for blessings enabling this study's completion. Deep appreciation extends to parents and family for unwavering prayers, support, and motivation. Sincere thanks go to supervising lecturers for guidance, advice, and valuable input during the research process. Gratitude is also extended to Tamalate Health Center, Makassar City, for permission and support, and to all respondents who participated. May these findings benefit and significantly contribute to scientific knowledge development.

References

1. Maharani H, Tarigan R, Sari NM. *Gambaran Tumbuh Kembang Anak Pada Periode Emas Usia 0-24 Bulan*. Vol 4.; 2019.
2. Anggryni M, Mardiah W, Hermayanti Y, Rakhmawati W, Ramdhanie GG, Mediani HS. Faktor Pemberian Nutrisi Masa Golden Age dengan Kejadian Stunting pada Balita di Negara Berkembang. *Jurnal Obsesi : Jurnal Pendidikan Anak Usia Dini*. 2021;5(2):1764-1776. doi:10.31004/obsesi.v5i2.967
3. Arifuddin A, Prihatni Y, Setiawan A, et al. Epidemiological Model Of Stunting Determinants in Indonesia. *Healthy Tadulako Journal (Jurnal Kesehatan Tadulako)*. 2023;9(2):224-234. doi:10.22487/htj.v9i2.928
4. Rochmatun Hasanah, Fahimah Aryani, Effendi B. Pemberdayaan Masyarakat Dalam Pencegahan Stunting Pada Anak Balita. *Jurnal Masyarakat Madani Indonesia*. 2023;2(1):1-6. doi:10.59025/js.v2i1.54
5. Nugroho MR, Sasongko RN, Kristiawan M. Faktor-faktor yang Mempengaruhi Kejadian Stunting pada Anak Usia Dini di Indonesia. *Jurnal Obsesi : Jurnal Pendidikan Anak Usia Dini*. 2021;5(2). doi:10.31004/obsesi.v5i2.1169
6. Kementerian Kesehatan Indonesia. *Profil Kesehatan Indonesia*.; 2021.
7. Ruswati, Wulandari Leksono A, Kartika Prameswary D, et al. Risiko Penyebab Kejadian Stunting pada Anak. *Jurnal Pengabdian Kesehatan Masyarakat: Pengmaskesmas*. 2021;1(2):34-38. doi:10.31849/pengmaskesmas.v1i2/5747
8. Apriluana G, Fikawati S. Analisis Faktor-Faktor Risiko terhadap Kejadian Stunting pada Balita (0-59 Bulan) di Negara Berkembang dan Asia Tenggara. *Media Penelitian dan Pengembangan Kesehatan*. 2018;28(4):247-256. doi:10.22435/mpk.v28i4.472
9. Fitri R, Huljannah N, Rochmah TN. Program Pencegahan Stunting di Indonesia : A Systematic Review. *Media Gizi Indonesia (National Nutrition Journal)*. 2022;17(3):281-292. doi:10.204736/mgi.v17i3.281-292
10. Arifuddin H, Arifuddin H, Arifuddin A, Nur AF. The Risk Factors of Stunting Children Aged 0-5 Years in Indonesia: A Multilevel Analysis. *Healthy Tadulako Journal (Jurnal Kesehatan Tadulako)*. 2023;9(1):109-120. doi:10.22487/htj.v9i1.1004
11. Unicef Indonesia. *Ringkasan Kajian Gizi Ibu Dan Anak*.; 2012.
12. Khoiriyah H, Aisyiyah. Faktor Kejadian Stunting pada Balita: Systematic Review. *Jurnal Ilmu Kesehatan Masyarakat (The*

Public Health Science Journal). 2023;12(1):28-40.

13. Sholeha A. Hubungan Tinggi Badan Ibu dengan Kejadian Stunting pada Anak Usia 24-59 Bulan di Kecamatan Wonomerto Kabupaten Probolinggo tahun 2022. *Healthy Tadulako Journal (Jurnal Kesehatan Tadulako)*. 2023;9(1):19-26. doi:10.22487/htj.v9i1.575
14. Atmi Rahmawati Luluk, Ranggauni Hardy Fathinah, Purbasari Anggraeni Dyah. Faktor-Faktor yang Berhubungan dengan Stunting Sangat Pendek dan Pendek pada Anak Usia 24-59 Bulan di Kecamatan Sawah Besar. *Jurnal Ilmiah Kesehatan Masyarakat*. 2020;12(2):68-78.
15. Sahitarani AS, Paramashanti BA, Sulistiyawati. Kaitan Stunting dengan Frekuensi dan Durasi Penyakit Infeksi pada Anak Usia 24-59 Bulan di Kecamatan Sedayu Kabupaten Bantul. *Journal of Nutrition Collage*. 2020;9(3):202-207.
16. Dharmawan BR. *Hubungan Riwayat Penyakit Infeksi Dengan Kejadian Stunting Pada Balita Usia 12-59 Bulan Studi Case Control Di Wilayah Kerja Puskesmas Guntur II Kabupaten Demak*. Universitas Islam Sultan Agung; 2024.
17. Firna E, Setiarini A. Faktor Risiko Kejadian Stunting pada Anak Balita : Literature Review. *MPPKI Media Publikasi Promosi Kesehatan Indonesia* . 2023;6(5):1-11.
18. Sutriyawan A, Kurniawati RD, Rahayu S, Habibi J. Hubungan Status Imunisasi dan Riwayat Penyakit Infeksi dengan Kejadian Stunting pada Balita : Studi Retrospektif. *Journal of Midwifery*. 2020;8(No.2):2-9.
19. Vasera RA, Kurniawan B. Hubungan Pemberian Imunisasi dengan Kejadian Anak Stunting di Puskesmas Sungai Aur Pasaman Barat tahun 2021. *Jurnal Kedokteran STM (Sains dan Teknologi Medik)*. 2023;6(1):82-90.
20. Jezua E, Silitonga hanna, Rambung E. Asi Eksklusif, Status Imunisasi dan Kejadian Stunting di Indonesia : Studi Literatur. *Prominentia Medical Journal*. 2021;2(1):17-26.
21. Fadhila AR, Hamdiah D, Sari R. *Hubungan Pemberian Imunisasi Dasar Lengkap Dengan Kejadian Stunting Pada Anak Balita Di Wilayah Kerja Puskesmas Singandaru*.; 2024.