DOI: 10.36566/ijhsrd/Vol7.Iss2/325
https://ijhsrd.com/index.php/ijhsrd

Indonesian Journal Of Health Sciences Research and Development

e- ISSN: 2715-4718

Research Article

THE RISK FACTORS FOR WASTING IN CHILDREN AGED 24–59 MONTHS IN RURAL AREAS OF WEST SUMATRA PROVINCE: ANALYSIS OF SKI 2023 DATA

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ABSTRACT

Background: Wasting is still a major health problem in toddlers, especially in rural areas. This study aims to analyze the risk factors of wasting in children under five years of age 24-59 months in rural areas of West Sumatra Province.
Methods: This study used a quantitative approach with a cross-sectional design. The study used secondary data from the Indonesian Health Survey in 2023 with a sample size of 541 toddlers. Data analysis was conducted bivariate using the chi-square test.
Results: The results of the analysis showed that of the five variables studied, the history of infectious diseases (p=0.001) and vitamin A supplementation (p=0.003) had a significant association with the incidence of wasting in children aged 24-59 months in rural areas of West Sumatra Province. Meanwhile, economic status (p=0.414), environmental sanitation (p=0.104), and drinking water source (p=0.094) had no significant association.
Conclusion: In rural areas, infectious diseases and lack of vitamin A supplementation were the causes of wasting. Health promotion and prevention of infectious diseases need to be evaluated and improved including efforts to increase the immune system of children under five.

Keywords: *Wasting, Rural, West Sumatera, Children, nutrition*

INTRODUCTION

Toddler affected by wasting have a body mass that is not proportional to their height.(1) Wasting has an impact on infants in the form of a weakened immune system, decreased ability to interact with the environment, increased frequency of crying, reduced social interaction with peers, lack of joy, and a tendency to become apathetic. Long-term effects can affect physical condition, cognitive impairment, reduced academic performance, behavioral problems, and increased future health risks, and can lead to death.(2)

In 2022, the WHO and UNICEF reported that approximately 45 million (6.8%) children under the age of 5 were affected by wasting, and 13.6 million (2.1%) suffered from severe wasting. This figure still exceeds the WHO target of less than 5% of children suffering from wasting worldwide.(3)

According to data from the 2023 Survei Kesehatan Indonesia (SKI), the prevalence of wasting in Indonesia is 9.2%. This figure exceeds the target set in the 2024 National Medium-Term Development Plan (RPJMN), which is 7%.(4)

Wasting remains a serious nutritional problem in Indonesia, especially in rural areas. Urban and rural areas have different characteristics, both in terms of socioeconomic factors and health facilities and services. Rural areas face challenges such as limited access to health services, an unsupportive environment, and socioeconomic factors. (5)

This emphasizes the need to conduct similar studies in rural areas such as West Sumatra Province to understand the risk factors for wasting in rural areas. The purpose of this study is to identify the risk factors for wasting in children aged 24-59 months in rural areas of West Sumatra Province.

MATERIAL AND METHODS

This study is an analytical survey study with a cross-sectional approach. The population in this study includes all toddlers living in rural areas of West Sumatra Province and recorded in the 2023 Survey Kesehatan Indonesia (SKI). All data that met the criteria, totaling 541 toddlers, were analyzed in this study.

The inclusion criteria for this study were infants aged 24–59 months at the time of data collection for the 2023 SKI, who were successfully interviewed and had measurements taken. Meanwhile, exclusion criteria included incomplete (missing) data and infants with congenital abnormalities. The research instrument used was secondary data from the 2023 SKI obtained through a questionnaire. Data analysis was conducted using bivariate analysis with the chi-square test.

RESULTS

Table 1 Descriptive analysis of variables

Variabel	f	%
Wasting		
No	462	85,5
Yes	79	14,5
History of Infectious Diseases		
No	465	86,0
Yes	76	14,0
Vitamin A Supplement		
receive, last 12 months	455	84,1
did not receive, last 12 months	86	15,9
Household wealth		
High	281	51,9
Low	260	48,1
Sanitation		
eligible	393	72,6
not eligible	148	27,4
Drinking Water Source		
eligible	446	82,4
not eligible	95	17,6

Based on Table 1, it can be explained that out of 541 research samples, 14.5% of toddlers experienced wasting. The prevalence of wasting in rural areas was higher than the total wasting in West Sumatra Province, which was 9.4%. A total of 465 toddlers (86%) had no history of infectious diseases during the last month. Additionally, the majority of infants had received vitamin A, totaling 455 children (84.1%). Regarding household wealth, most infants came from families with high economic status, totaling 281 children (51.9%). Living environment conditions were also observed. Most infants lived in environments with adequate sanitation conditions, totaling 392 children (72.6%). Additionally, most infants had access to adequate drinking water sources, totaling 446 children (82.4%)

Table 2 Relationship between Independent Variables and Wasting

Variable	*Wasting* No		Yes		Total		POR (95%CI)	*p-value*
	f	%	f	%	f	%		
History of Infectious Diseases								
No	410	88,2	55	11,8	465	100	3,358 (1,033-5,942)	0,000
Yes	52	68,9	24	31,1	76	100		
Vitamin A Supplement								
receive, last 12 months	399	87,8	56	12,2	455	100	2,603 (1,367-4,954)	0,003
did not receive, last 12 months	63	73,4	23	26,6	86	100		
Household wealth								
High	243	86,8	37	13,2	280	100	1,251 (0,729-2,147)	0,414
Low	219	84,0	42	16,0	261	100		
Sanitation								
eligible	343	87,3	50	12,7	393	100	1,663 (0,897-3,081)	0,104
not eligible	119	80,6	29	19,4	148	100		
Drinking Water Source								
eligible	387	86,8	59	13,2	446	100	1,729 (0,905-3,303)	0,094
not eligible	75	79,2	20	20,8	95	100		

Based on Table 2, toddlers who experienced wasting and had a history of infectious disease (31.1%) were higher than toddlers who experienced wasting and did not have a history of infectious disease (11.8%). The p-value of 0.001 indicates a statistically significant relationship between a history of infectious disease and the incidence of wasting ($p < 0.05$). The analysis results show a POR value of 3.358 with a 95% confidence interval (CI: 1.033–5.942), indicating that infants with a history of infection are 3.4 times more likely to experience wasting than infants without a history of infection.

In addition to a history of infectious diseases, vitamin A supplementation also showed a significant association with the incidence of wasting. As shown in Table 2, the percentage of infants experiencing wasting who did not receive vitamin A (26.6%) was higher than that of infants experiencing wasting who did receive vitamin A (12.2%). The p-value of 0.003 indicates a statistically significant association between vitamin A supplementation and the occurrence of wasting. The odds ratio (OR) obtained was 2.603 with a 95% confidence interval (CI: 1.367–4.954), meaning that infants who did not receive vitamin A had a 2.6 times higher likelihood of experiencing wasting compared to those who did receive vitamin A.

Meanwhile, several other variables did not show a statistically significant relationship with wasting. Based on Table 2, toddlers who experienced wasting from low-income families (16.0%) were higher than toddlers who experienced wasting from high-income families (13.2%). However, the p-value of 0.412 indicates that there is no statistically significant association between economic status and the occurrence of wasting. The OR value of 1.251 with a 95% confidence interval (CI: 0.729–2.147) supports this finding.

A similar finding was observed in the sanitation condition variable. Based on Table 2, the percentage of children under five with wasting who lived in homes with inadequate sanitation (19.4%) was higher than that of children under five with wasting who lived in homes with adequate sanitation (12.7%). The p-value of 0.104 (> 0.05) indicates that there is no statistically significant relationship between sanitation and the occurrence of wasting. The OR value is 1.663 with a CI of 0.897–3.081.

Similarly, based on Table 2, toddlers who experienced wasting and used unsafe drinking water sources (20.8%) were higher than toddlers who experienced wasting and used safe drinking water sources (13.2%). The p-value of 0.094 (> 0.05) indicates that there is no statistically significant relationship between the safety of drinking water sources and the incidence of wasting. The POR value is 1.729 (CI: 0.905–3.303).

Based on research findings, toddlers who have experienced infectious diseases, such as diarrhea or acute respiratory infections, are at greater risk of wasting because infections can interfere with nutrient absorption and reduce appetite. Infants living in rural areas are more likely to be exposed to the risk of infectious diseases, for example due to limited access to clean water, sanitation, or healthcare services in some areas, making infants more vulnerable to infections and resulting in suboptimal treatment. Infections and malnutrition are interconnected in a recurring cycle. Infections lead to poor nutritional status, and poor nutrition weakens a child's immune system, making them more susceptible to subsequent infections. This cycle can exacerbate wasting if not addressed promptly.

DISCUSSION

Vitamin A deficiency in children has been linked to an increased risk of infectious diseases, particularly diarrhea and acute respiratory infections (ARI), both of which are major risk factors for wasting. The combination of reduced nutrient intake, nutrient loss, and increased metabolic demands due to infection creates ideal conditions for the development of wasting. Therefore, vitamin A deficiency indirectly increases the likelihood of wasting through

mechanisms of susceptibility to infectious diseases. (6)

Based on this study, toddlers who do not receive vitamin A are at greater risk of wasting. Vitamin A plays an important role in maintaining the immune system, helping epithelial function, and supporting child growth and development. In toddlers living in rural areas, vitamin A supplementation may not be optimal due to limited access to health centers, low awareness among some parents about the importance of vitamin A supplementation, and challenges in implementing program distribution in some areas. Vitamin A deficiency can weaken the immune system, making children more susceptible to infections, and increasing the risk of entering a cycle of malnutrition and recurrent infections. Without adequate vitamin A intake, children's bodies struggle to fight infections, leading to wasting or its worsening. (7)

Based on this study, one of the reasons is that in rural areas, access to staple foods such as vegetables, fruits, and protein sources (such as fish or livestock products) tends to be easier and cheaper, and can even be obtained from one's own garden or livestock. This means that even though families may be classified as economically disadvantaged based on survey indicators (such as household possessions or expenditure), food sufficiency can still be met locally and independently. Additionally, the measurement of economic status in the SKI survey is based on household asset indicators, such as vehicle ownership, television ownership, or the type of flooring in the home. These indicators do not always reflect actual access to food or child care, especially in rural areas where lifestyles differ from those in urban areas. (8,9)

Sanitation in this study refers to household access to adequate fecal disposal facilities, as classified in the 2023 SKI data, including toilet types and final fecal disposal.(10) According to the UNICEF framework, sanitation is an indirect cause of child malnutrition. Inadequate sanitation exposes children to unclean and contaminated environments more frequently, such as dirty water, unsanitary toilets, and improper waste disposal. These conditions increase the risk of infectious diseases like diarrhea, parasitic infections, and other gastrointestinal infections. (11)

Based on the results of the study, this may be due to the fact that the sanitation indicators used only consider the type of facilities available (e.g., squat toilets or latrines), without taking into account daily usage behaviors such as maintaining a clean environment or family members regularly washing their hands with soap after defecating. Additionally, in rural areas, sanitation tends to be uniform across households, so the differences are not very noticeable. As a result, this situation causes the sanitation variable to not appear to have a statistically significant effect on wasting in infants. (12,13)

The use of unsuitable water sources such as dug wells and boreholes actually increases the risk of wasting in toddlers, because water from these sources is generally unsafe for direct consumption without prior treatment. This indicates that water from these sources requires additional treatment to make it safe and help reduce the risk of wasting in the study area. (14)

Based on the results of the study, most respondents used drinking water sources that were classified as acceptable, such as tap water or protected wells, so there were no significant variations between groups that would lead to meaningful differences in risk. Although the types of water sources were categorized as acceptable, the actual quality

of the water (such as bacterial content or treatment before consumption) was not directly measured in the data. (15)

CONCLUSION

Programs to reduce wasting in rural toddlers must consider aspects of prevention and treatment of infectious diseases in tandem. Improvements in nutritional intake without accompanying prevention and management of infectious diseases in children will not be optimal. In children without infections, nutritional intake should still be enhanced with additional vitamin A to boost the immune system of infants. Other aspects also need to be considered regarding the emergence of infectious diseases and their impact on the optimal.

ACKNOWLEDGMENT

We would like to express our gratitude to the Dean of the Faculty of Public Health, Andalas University, and our supervisors for their guidance and advice. We would also like to thank all lecturers and academic staff at the Faculty of Public Health, Andalas University, for their support during the completion of this research.absorption of nutritional intake in infants.

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