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Wasting Stunting (WaSt) Among Toddlers 6-23 Months in Indonesia

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Abstract

Wasting stunting (WaSt) is a condition in which wasting and stunting occur in a child at the same time. In Indonesia, the prevalence of WaSt was 2.4% among children 6 to 59 months in 2021 (Jokhu & Syauqy, 2024). Research on factors related to WaSt has not been widely conducted in Indonesia. The purpose of this study is to find out the factors associated with WaSt among toddlers aged 6–23 months in Indonesia. This study is analytical research with a cross sectional design using SSGI 2022 data. The population in this study is all toddlers among SSGI 2022 respondents. The sample in this study is toddlers aged 6–23 months in Indonesia. The sampling technique used was the total sample. The sample in this study was 41257 toddlers (6–23 months). The prevalence of stunting, wasting, underweight, and WaSt was 16.1%, 7.62%, 11.8%, and 1.15%, respectively. Variables related to the incidence of wasting stunting (WaSt) were diarrhea (PR = 1,331), pneumonia (PR = 2,599), pulmonary tuberculosis (PR = 4,048), birth weight (PR = 4,571), birth length (PR = 2,437), mothers' education level (PR = 1,213), and mothers' work (PR = 1,525). Factors related to WaSt among toddlers aged 6–23 months in Indonesia are diarrhea, pneumonia, pulmonary TB, birth weight, birth body length, maternal education level, and maternal employment.

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INTRODUCTION

Nutrition problems in children are still a priority problem in the world. Almost half of the deaths of children under the age of 5 are due to malnutrition (UNICEF, WHO, et al., 2023). Wasting is a form of acute malnutrition as a result of a lack of food intake or experiencing infectious diseases that occur in a short period of time and are characterized by a lack of weight according to height (Ministry of Health of the Republic of Indonesia, 2020). Wasting is characterized by weight according to the child's height being less than -2 standard deviation based on WHO standards (WHO, 1995; De Onis et al., 2019). Stunting is a growth and development disorder experienced by children due to malnutrition, recurrent infections, and inadequate psychosocial stimulation (WHO, 2015). Stunting occurs due to the impact of chronic malnutrition during the first 1,000 days of a child's life (Atmarita et al., 2015). Toddlers are said to be stunted if their height relative to their age has a z-score of less than 2 standard deviations based on the WHO Child Growth Standards (WHO, 1995; De Onis et al., 2019). Wasting stunting (WaSt) is a condition in which wasting and stunting occur in a child at the same time (Jokhu & Syauqy, 2024).

The prevalence of stunting in the world is 22.3% (148.1 million), and of this figure, 26.4% of stunted children under five are in the Southeast Asian region (UNICEF, 2023). The prevalence of stunting in Indonesia ranks 27th highest out of 154 countries that have stunting data. Indonesia is ranked 5th among countries in Asia and 2nd in Southeast Asia (UNICEF, 2023). 6.8% (45 million) of toddlers in the world experience wasting (too thin for their height), and even 13.6 million of them experience severe wasting (acute malnutrition), and more than half (56.2%) of children who suffer from wasting live in the Southeast Asian region (UNICEF, 2023). Globally, the prevalence of wasting in Indonesia ranks second highest in the world, with more than 760,000 children under the age of 5 suffering from wasting in 2021 (UNICEF, 2023). The prevalence of wasting and stunting in the world is still above the 2030 SDG target. The prevalence of wasting and stunting (WaSt) globally is estimated at 3% in children aged 6 to 59 months in 2018, the prevalence of WaSt in Asia is 3.4% and ranks second highest globally below Africa at 3.5% (Khara et al., 2018).

Wasting and stunting are two things that are interconnected; stunting is a risk factor for wasting, and vice versa, wasting is a risk factor for stunting (Thurstans et al., 2022). Wasting and stunting are interrelated nutritional problems, where these two nutritional problems have the same risk factors and worsen each other's condition. In addition to the high risk of death, children who are not properly treated have a three-fold higher risk of becoming stunted, and stunted children are 1.5 times more at risk of becoming wasting compared to children with good nutrition (UNICEF, 2023). The risk of child mortality increases if the child experiences these two nutritional problems (wasting and stunting) at the same time (Thurstans et al., 2022). Children with WaSt not only experience an increased risk of pain but also have a twelve times higher risk of death than children who are only wasting or stunting (Khara et al., 2018). The determinants of WASt in Indonesia are male gender, age 12-23 months, low birth weight, short birth length, maternal age > 35 years, having a history of infectious disease, not using posyandu, economic status, and rural residence (Jokhu & Syauqy, 2024).

One of the targets of the 2030 Sustainable Development Goals (SDGs) is to eliminate all forms of malnutrition, including wasting and stunting. The target of the Rencana Pembangunan Jangka Menengah Nasional (RPJMN) in 2024 is that the prevalence of wasting and stunting will decrease to 7% and 14%, respectively. The number of wasting and stunting incidents in Indonesia is still far above the 2030 SDG target and still above the national target in 2024. Research on WaSt has not been widely conducted in Indonesia, so researchers are interested in conducting research on factors related to wasting stunting (WaSt) in toddlers aged 6–23 months in Indonesia.

METHOD

This study is analytical research with a cross sectional design using SSGI 2022 data. The population in this study is all toddlers among

SSGI 2022 respondents. The sample in this study is toddlers aged 6–23 months in Indonesia who meet the inclusion and exclusion criteria. The sampling technique used in this study is the total sample. The sample in this study was 41257 toddlers (6–23 months). The independent variables in this study were acute respiratory infection, diarrhea, pneumonia, pulmonary tuberculosis, measles, exclusive breastfeeding, birth weight, birth body length, national health insurance ownership, KIA book ownership, antenatal care, sanitation access, maternal education, maternal employment, and residential area. The dependent variable in this study was the incidence of wasting stunting (WaSt). The inclusion criteria in this study are toddlers with an age of 6–23 months, and measurements are made of body length and weight. There is data on the date of measurement, date of birth, age, and complete data on the history of acute respiratory infection, diarrhea, pneumonia, pulmonary tuberculosis, measles, exclusive breastfeeding, birth weight, birth body length, National Health Insurance (JKN) ownership, KIA book ownership, ANC, access to sanitation, maternal education, maternal work, area of residence, and nutritional status of wasting stunting (WaSt) and normal nutritional status. Calculation of children's nutritional status with the WHO Anthro application.

The variable of history of acute respiratory tract infections is toddlers who have been diagnosed with acute respiratory infections in the past month; the variable of history of diarrheal diseases is toddlers who have been diagnosed with diarrhea in the last month; and the variable of history of pneumonia is toddlers who have been diagnosed with pneumonia in the last twelve months. A child with a history of pulmonary tuberculosis is a toddler who has been diagnosed with pulmonary tuberculosis by a health worker in the last twelve months. A measles history is a toddler who has been diagnosed with measles in the last twelve months. Exclusive breastfeeding is for babies who are breastfed only for six months and introduced to food or drinks (liquids) other than breast milk at the age of six months. The variables of birth weight and birth body length are the birth weight of toddlers and birth body length based on memory or records. National health insurance ownership is for children who have national health insurance, Jamkesda, or other health insurance. The owners of KIA books are toddlers who own KIA books. Antenatal care visits are the total frequency of visits by mothers to health care facilities to check on their pregnancy. Proper sanitation access is available in households that use latrines with gooseneck closets or sitting closets and fecal treatment facilities, wastewater disposal installations, or tanc septics. Mother's education is the last education that mothers complete. The mother's job status is that of a toddler mother.

Table 1. Book Kode SSGI 2022 Data Respondents

Variable	Book Kode
Wasting stunting (WaSt)	Individual questionnaire, block xv kode 1502 -1503
History of ARI	Individual questionnaire, block ix kode 901- 902
History of diarrhea	Individual questionnaire, block ix kode 903 - 904
History of diarrhea	Individual questionnaire, block ix kode 905 - 906
History of pulmonary TB	Individual questionnaire block, ix kode 907 - 908
History of measles	Individual questionnaire block ix kode 910 - 911
Exclusive breastfeeding	Individual questionnaire block xiii kode 1313
Birth Weight	Individual questionnaire block xiv kode 1405
Birth Length	Individual questionnaire block xiv kode 1407
Ownership of national Health Insurance	Household questionnaire block iv kode 412
Ownership KIA books	Individual questionnaire block x kode 1004
ANC	Individual questionnaire block xii kode 1201 - 1204
Access Sanitation Access	Household questionnaire block v kode 505 - 506
Maternal education	Household questionnaire block iv kode 410
Maternal occupation	Household questionnaire block iv kode 411
Residential area	Household questionnaire block i kode 105

Source: SSGI 2022

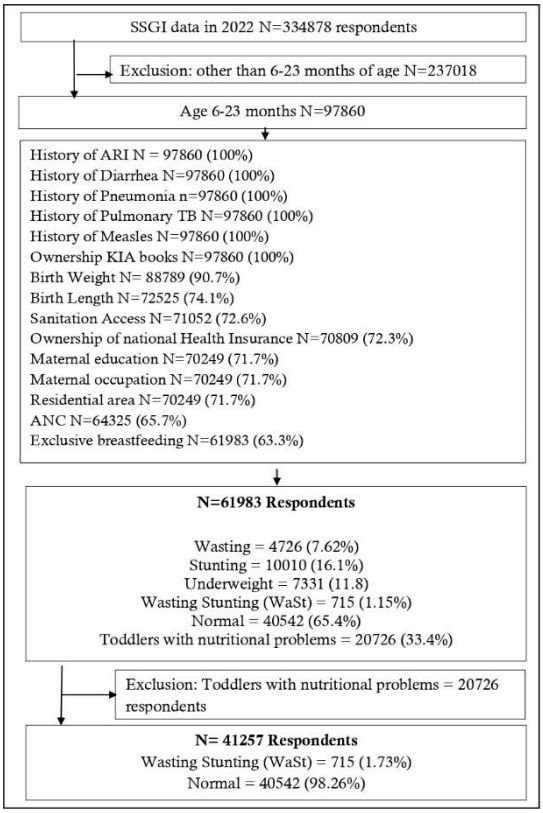

Figure 1. Flowchart SSGI 2022 Data Respondents
Source: SSGI 2022

The analysis of this study includes univariate analysis and bivariate analysis with chi-square. Bivariate analysis with SPSS 25. This research protocol has been approved by the Health Research Ethics Committee of Universitas Negeri Semarang, number 333/KEPK/FK/KLE/2024.

RESULTS AND DISCUSSIONS

Based on the results of the univariate analysis in Table 2, 2808 toddlers (6.8%) were toddlers who suffered from acute respiratory infections in the past month, while 38449 (93.2%) were toddlers who did not suffer from acute respiratory infections. Toddlers who suffered from diarrhea in the past month were 3217 toddlers (7.8%), while those who did not suffer from diarrhea were 38040 toddlers (92.2%). 464 toddlers (1.1%) suffered from pneumonia in the last twelve months, while 40793 (98.9%) did not suffer from pneumonia. Toddlers who suffered from pulmonary tuberculosis in the last twelve months were 121 (0.3%), while those who did not suffer from pulmonary tuberculosis were 41136 (99.7%). The number of toddlers who suffered from measles in the last twelve months was 2252 (5.5%), while the number of children under five who did not suffer from measles was 39005 toddlers (94.5%). Toddlers who received exclusive breastfeeding for six months were 32069 children (77.7%), while those who received breast milk for less than six months were 9188 children (22.3%). There were 1921 children under five who were born with a low birth weight of <2500 grams, while 39336 children (95.3%) were born with a weight of ≥ 2500 grams. There were 6944 children (16.8%) of toddlers who had a birth length less than 48 cm, while those of 500 children who had a birth length of ≥ were 34313 children (83.2%). There are 22362 children under five (54.2%) who do not have JKN, and 18895 children (45.8%) who have national health insurance. Toddlers who had KIA books were 39116 (94.8%), and those who did not have KIA books were 2141 children (5.2%). Mothers who underwent antenatal care examinations <4 times during pregnancy were 5828 children (14.1%), and mothers who underwent antenatal care examinations more than four times during pregnancy were 35429 children (85.9%). Households that have access to proper sanitation are 37341 households (90.5), while those that are not eligible are 3916 households (9.5%). Toddlers who have mothers with low education levels are 14555 children (35.3%), while toddlers who have mothers with higher education levels are 26702 children (64.7%). Toddlers who have working mothers are 25054 children (60.7%), and toddlers who have non-working mothers are 16203 children (39.3%). In the variable of residential area, 16296 toddlers (39.5%) lived in rural areas, while 24961 children (60.5%) lived in urban areas.

Based on the results of the chi square test in Table 3, the variable of history of acute respiratory tract infection has a p value of 0.141 ($p > 0.05$), which means that there is no relationship between the history of acute respiratory infection and WaSt among toddlers aged 6–23 months in Indonesia. The relationship between infectious diseases and stunting is difficult to determine because there are other

Table 2. Univariate Analysis Results

Variable	Frequency	%
Nutritional status		
Wasting Stunting (WaSt)	715	1,7
Normal	40542	98,3
Acute respiratory infections		
Yes	2808	6,8
No	38449	93,2
Diarrhea		
Yes	3217	7,8
No	38040	92,2
Pneumonia		
Yes	464	1,1
No	40793	98,9
Pulmonary TB		
Yes	121	0,3
No	41136	99,7
Measles		
Yes	2252	5,5
No	39005	94,5
Exclusive breastfeeding		
< 6 months	9188	22,3
6 months	32069	77,7
Birth Weight		
< 2500 grams	1921	4,7
≥ 2500 grams	39336	95,3
Body Length at Birth		
< 48 cm	6944	16,8
≥ 48 cm	34313	83,2
National health insurance ownership		
No	22362	54,2
Yes	18895	45,8
Ownership of KIA books		
No	2141	5,2
Yes	39116	94,8
Antenatal care		
<4 times during pregnancy	5828	14,1
≥ 4 times during pregnancy	35429	85,9
Sanitation Access		
Unimproved	3916	9,5
Improved	37341	90,5
Mother's Education		
Low	14555	35,3
Hight	26702	64,7
Mother's Occupation		
Work	25054	60,7
Doesn't work	16203	39,3
Area of Residence		
Rural	16296	39,5
Urban	24961	60,5

Source: SSGI 2022

factors that occur at the same time (De Vita et al., 2019). This is not in line with research (Jokhu & Syauqy, 2024) showing that there is a relationship between infectious diseases and Wasting Stunting (WaSt). Infectious diseases can cause malnutrition due to appetite disorders, which can lead to a decrease in food intake into the body. This condition can cause malnutrition and weight loss (De Vita et al., 2019). Recurrent infections will decrease nutritional status through decreased appetite, impaired food absorption, increased catabolism and diversion of nutrients from growth, and changes in immune response (Soviyati et al., 2023).

The history of diarrheal disease has a p value of 0.027 (p <0.05), which means that there is a relationship between the history of diarrhea and Wasting Stunting (WaSt) among toddlers aged 6–23 months in Indonesia. The PR value in this study was 1,331, which means that children who have a history of diarrheal disease are at increased risk of experiencing Wasting Stunting (WaSt) 1,331 times compared to children who do not have a history of diarrhea. The results of this study are in line with research (Al-Taj et al., 2023) showing that toddlers with a history of diarrhea have a risk of experiencing Wasting Stunting (WaSt) 2.12 times compared to toddlers without a history of diarrhea. When a child has a diarrheal infection, he will lose his appetite, so that the intake of nutrients is reduced, while the nutrients consumed also fail to be absorbed properly by the body. A child's poor appetite caused by diarrhea can contribute to worsening infections and stunting growth (Tsehay et al., 2021).

A history of pneumonia has a p value of <0.0001 (p <0.05), which means that there is a relationship between a history of pneumonia and Wasting Stunting (WaSt) among toddlers aged 6–23 months in Indonesia. The PR value in this study was 1,331, which means that children who have a history of pneumonia are at risk of experiencing Wasting Stunting (WaSt) 2,599 times compared to children who do not have a history of pneumonia. The results of this study are in line with the results of a study (Dewi & Pawenang, 2023) conducted in the Bojonegoro Regency Council District that found a relationship between a history of pneumonia and the incidence of stunting with a p value of 0.002

and an OR of 7.875. A history of infectious diseases, including diarrhea, pneumonia, and acute respiratory infections, affects the level of energy needed to form immunity and repair cells, so insufficient energy intake due to decreased appetite can lead to malabsorption and worsen the child's condition (Prendergast & Humphrey, 2014). Pneumonia causes decreased appetite, and frequent vomiting, as well as increased energy requirements needed to support physiological changes such as fever and increased respiratory work, so children with pneumonia have a higher risk of malnutrition (Walson & Berkley, 2018).

The history of pulmonary TB has a p value of 0.001 (p <0.05), which means that there is a relationship between the history of pulmonary TB and Wasting Stunting (WaSt) among toddlers aged 6–23 months in Indonesia. The PR value in this study was 4,048, which means that children who have a history of pulmonary TB are at increased risk of experiencing Wasting Stunting (WaSt) 4,048 times compared to children who do not have a history of pulmonary TB disease. This is in line with research (Jokhu & Syauqy, 2024) showing that there is a relationship between infectious diseases and Wasting Stunting (WaSt) with a p value of 0.001 and an OR of 1.53.

Malnutrition and pulmonary tuberculosis are linked and have a bidirectional relationship. Undernutrition increases the risk of pulmonary tuberculosis, and vice versa, pulmonary tuberculosis can cause malnutrition (Padmapriyadarsini et al., 2016). Pulmonary tuberculosis is one of the infectious diseases that causes stunting in children (Valentina et al., 2023). Pulmonary tuberculosis causes loss of appetite, cachexia, and wasting and affects malnutrition status (Munthali et al., 2017). Studies have shown that patients with active pulmonary tuberculosis are always malnourished with decreased visceral protein, anthropometric index, and micronutrient status (Appiah et al., 2021). Tuberculosis itself causes decreased appetite, malabsorption of nutrients, malabsorption of micronutrients, and metabolic changes that lead to weight loss and poor nutritional status (Kant et al., 2015).

The history of measles has a p value of 0.282 (p > 0.05), which means that there is no relationship between the history of measles and Wasting Stunting (WaSt) among toddlers aged 6–23 months in Indonesia. This is not in line with research (Fitri et al., 2024) showing that there is a relationship between measles history and stunting in clowns in five provinces in Indonesia with a p value of <0.0001 and OR 2.568. The results of this study are also not in line with the research (Nsubuga et al., 2022), which found that there is a difference between the history of measles and the incidence of stunting (p value 0.019). Measles and malnutrition are reciprocal factors. Malnourished children are more likely to develop measles complications and have a higher case mortality rate, whereas measles infection can in turn worsen children's nutritional status (Noori et al., 2022). Infectious diseases can cause malnutrition due to appetite disorders, which can lead to a decrease in food intake into the body. This condition can cause malnutrition and weight loss (De Vita et al., 2019). Malnourished children are more likely to develop measles complications and have a higher case mortality rate, whereas measles infection can in turn worsen children's nutritional status (Noori et al., 2022).

The history of exclusive breastfeeding has a p value of 0.074 (p > 0.05), which means that there is no relationship between the history of exclusive breastfeeding and Wasting Stunting (WaSt) among toddlers aged 6–23 months in Indonesia. The results of this study are in line with research (Jokhu & Syauqy, 2024) that there is no relationship between exclusive breastfeeding and Wasting Stunting (WaSt) with a p value of 0.584. However, this study could not distinguish between exclusive breastfeeding for only 6 months, more continuous breastfeeding, and delayed breastfeeding, so further research is needed to see a clear relationship between exclusive breastfeeding and Wasting Stunting (WaSt). Besides that, this study could not see adequate nutrition for mothers while breastfeeding. Adequate nutrition for breastfeeding mothers is essential for the health of their babies; a quarter of mothers who exclusively breastfeed are malnourished. Malnutrition during this crucial period can result in impaired growth and development in newborns (Ahmed et al., 2024). Exclusive breastfeeding is a protection against stunting because breast milk contains nutrients that can increase the body's immunity,

prevent infections, and provide nutrients for optimal growth and development, as well as protection from the risk of chronic diseases (Rachmayanti et al., 2022). This breast milk is a nutrient for babies that continues to change and is fed with the development of the baby until the age of six months. After the baby passes the age of six months, it is necessary to add complementary foods to breast milk because the content of breast milk alone does not meet the needs of the baby (Nurokhmah et al., 2023).

The variable of birth weight history has a p value of <0.0001 (p<0.05), which means that there is a relationship between birth weight and wasting stunting (WaSt) among toddlers aged 6–23 months in Indonesia. The PR value in this study was 4,571, which means that children with low birth weight are 4,571 times at risk of experiencing Wasting Stunting (WaSt) compared to children born with normal weight. The results of this study are in line with research (Jokhu & Syauqy, 2024) that there is a meaningful relationship between birth weight and Wasting Stunting (WaSt) with a p value of <0.001 and an OR of 4.08. The growth and development of a child begin from the moment it is formed in the womb, and several factors will determine its nutritional status before and after birth; for example, maternal health will affect weight at birth (Tello et al., 2022). Low birth weight is associated with premature birth or intrauterine growth retardation (Kale & Fonseca, 2023). Babies with low birth weight have experienced intrauterine growth restriction, which causes slower growth and development and often fails to keep up with the growth rate that must be achieved at their age after birth. Low birth weight is associated with an increased risk of stunted child growth by more than 2 times (Vats et al., 2024).

Based on the results of the chi square test, the variable of birth body length history has a p value of <0.0001 (p<0.05), which means that there is a relationship between birth body length and Wasting Stunting (WaSt) among toddlers aged 6–23 months in Indonesia.

The PR value in this study was 2,437, which means that children who have a birth length of less than 48 cm are at risk of experiencing Wasting Stunting (WaSt) 2,437 times compared to children born with a body length of more than 48 cm. The results of this study are in line with research (Jokhu & Syauqy, 2024) showing that there is a meaningful relationship between birth body length and Wasting Stunting (WaSt) with a p value of <0.001 and an OR of 2.5.Children born less than 48 cm in length have a 15.0 times higher risk of stunting (Hastuti et al., 2020). Poor maternal conditions such as malnutrition, stress, and having congenital diseases can also affect fetal growth and development, such as short birth body length, which will have an impact on the height of children in early childhood and adulthood (Dorélien, 2015).

The variable of national health insurance ownership has a p value of 0.199 (p > 0.05), which means that there is no relationship between JKN ownership and Wasting Stunting (WaSt) among toddlers aged 6–23 months in Indonesia. The results of this study are not in line with research (Fairuza et al., 2023) conducted in the working area of the Anggdita Health Center, Karawang, which found a relationship between national health insurance ownership and stunting with a p value of 0.045. The main goal of the national health insurance program is to increase public accessibility to health services according to needs (Wira, 2018). This can illustrate that the more people who have health insurance, the higher the opportunity for families to improve the health status of family members, including reducing the risk of stunting (Ernawati & Uswatul, 2019).

Based on the results of the bivariate analysis, the variable of KIA book ownership has a p value of 0.812 (p > 0.05), which means that there is no relationship between KIA book ownership and Wasting Stunting (WaSt) among toddlers aged 6–23 months in Indonesia. This study could not see the completeness of the content of the KIA book, so it could not see between toddlers who had a complete and incomplete KIA book to see a more in-depth relationship between the use of KIA books. The results of the study (Bima, 2024) found a significant relationship between maternal monitoring and filling out KIA books on stunting incidence (p<0.001). In the KIA book, there is KMS, which can be used to monitor children's

Table 3. Bivariate Analysis Results

Variable	Nutritional Status				*p-value*	PR (CI 95%)
	WaSt		Normal			
	N	%	N	%		
Acute respiratory infections						
Yes	59	2.1	2749	97.9	0.141	-
No	656	1.7	40542	98.3		
Diarrhea						
Yes	72	2.2	3145	97.8	0.027	1.331 (1.041-1.703)
No	643	1.7	37397	98.3		
Pneumonia						
Yes	20	4.3	444	95.7	<0.0001	2.599 (1.650-4.093)
No	695	1.7	40098	98.3		
Pulmonary TB						
Yes	8	6.6	113	93.4	0.001*	4.048 (1.969-8.325)
No	707	1.7	40429	98.3		
Measles						
Yes	46	2.0	2206	98.0	0.282	-
No	669	1.7	38336	98.3		
Exclusive breastfeeding						
< 6 months	139	1.5	9049	98.5	0.074	-
6 months	576	1.8	31493	98.2		
Birth Weight						
< 2500 grams	125	6.5	1796	93.5	<0.0001	4.571 (3.747-5.575)
≥ 2500 grams	590	1.5	38746	98.5		
Body Length at Birth						
< 48 cm	233	3.4	6711	93.5	<0.0001	2.437 (2.080-2.856)
≥ 48 cm	482	1.4	33831	98.6		
National health insurance ownership						
No	405	1.8	21957	98.2	0.199	-
Yes	310	1.6	18585	98.4		
Ownership of KIA books						
No	39	1.8	2102	98.2	0.812	-
Yes	676	1.7	38440	98.3		
Antenatal care						
<4 times during pregnancy	86	1.5	5742	98.5	0.116	-
≥ 4 times during pregnancy	629	1.8	34800	98.2		
Sanitation Access						
Unimproved	64	1.6	3852	98.4	0.665	-
Improved	651	1.7	36690	98.3		
Mother's Education						
Low	284	2.0	14271	98.4	0.014	1.213 (1.043-1.411)
Hight	431	1.6	26271	98.4		
Mother's Job						
Work	501	2.0	24553	98.0	<0.0001	1.525 (1.297-1.791
Doesn't work	214	1.3	15989	98.7		
Area of Residence						
Rural	294	1.8	16002	98.2	0.392	-
Urban	421	1.7	24540	98.3		

Source: SSGI 2022
*Fisher test

nutritional status, one of which is stunting events,so that parents can monitor and prevent stunting from an early age (Sistiarani et al., 2017). Based on the results of bivariate analysis, the antenatal care history variable has a p value of 0.116 (p > 0.05), which means that there is no relationship between antenatal care history and Wasting Stunting (WaSt) among toddlers aged 6–

23 months in Indonesia. The results of this study are not in line with (Camelia, 2020) that the quality and quantity of ANC visit histories are related to stunting in Pujon District, Malang Regency (p value 0.003). ANC frequencies that are in accordance with standards will make it easier for health workers to monitor the growth and development of the fetus and mother optimally. The frequency of antenatal care can also change from the mother's behavior to what is conveyed by health workers so that behavioral changes to health, especially the pregnancy, go well (Camelia, 2020).

Based on the results of the bivariate analysis, the sanitation access variable has a p value of 0.665 (p > 0.05), which means that there is no relationship between sanitation access and Wasting Stunting (WaSt) among toddlers aged 6–23 months in Indonesia. In line with research (Jokhu & Syauqy, 2024), access to sanitation is not related to wasting stunting (WaSt) in Indonesia, with a p value of 0.254. The results of this research are not in line with research (Torlesse et al., 2016) showing that toddlers who are in households with inappropriate access to sanitation are at risk of stunting 3.47 times (p<0.001) compared to toddlers who live in households with proper sanitation access. The results of this study are also not in line with the research (Khura et al., 2023) on proper toilet sanitation access to Wasting Stunting (WaSt), with a p value of <0.001. Environmental sanitation aspects are related to the incidence of stunting (Woldesenbet et al., 2023).

The results of the chi square test of bivariate analysis on the variable of maternal education level had a p value of 0.014 (p<0.05), which means that there was a relationship between maternal education level and Wasting Stunting (WaSt) among toddlers aged 6–23 months in Indonesia. The PR value in this study was 1,213, which means that toddlers who have mothers with low education are 1,213 times at risk of experiencing Wasting Stunting (WaSt) compared to toddlers who have mothers with higher education. The results of this study are in line with research (Khura et al., 2023) that the level of maternal education is related to Wasting Stunting (WaSt) with a p value of <0.001. Maternal education is a critical factor that indirectly affects nutritional status because education affects parenting in children (Laksono et al., 2021).

The variable of maternal employment status has a p value of <0.0001 (p<0.05), which means that there is a relationship between maternal employment status and Wasting Stunting (WaSt) among toddlers aged 6–23 months in Indonesia. The PR value in this study is 1,525, which means that toddlers who have working mothers are 1,525 times at risk of experiencing Wasting Stunting (WaSt) compared to toddlers who have mothers who do not work. The employment status of mothers has a relationship with the incidence of stunting among toddlers (Rahayuwati et al., 2023). Mother's work is related to an increased risk of stunting in children (Win et al., 2022).

The results of this study are in line with research (Laksono et al., 2022) showing that the employment status of mothers is related to stunting in Indonesia, with a p value of <0.001. Working mothers have more children with stunting and wasting than mothers who do not work (Ketema et al., 2022). Based on the results of a study (Ketema et al., 2022) conducted on children aged 6–23 months, mothers who do not work have a better nutritional status than working mothers. In addition to doing household responsibilities, mothers also work outside the home to earn an income for their families, which makes them too busy to provide enough time to feed and nurture their children. Therefore, children born to working mothers face suboptimal breastfeeding, early introduction of complementary foods, and a lack of social attention (Naah et al., 2019). Based on the results of a study (Ketema et al., 2022) conducted on children aged 6–23 months, mothers who do not work have a better nutritional status than working mothers. In addition to doing household responsibilities, mothers also work outside the home to earn an income for their families, which makes them too busy to provide enough time to feed and nurture their children. Therefore, children born to working mothers face suboptimal breastfeeding, early introduction of complementary foods, and a lack of social

attention (Naah et al., 2019).

CONCLUSION

The variables associated with the incidence of wasting stunting (WaSt) were diarrhea (PR = 1,331), pneumonia (PR = 2,599), pulmonary tuberculosis (PR = 4,048), birth weight (PR = 4,571), birth length (PR = 2,437), maternal education level (PR = 1,213), and maternal occupation (PR = 1,525). Variables that were not related to the incidence of wasting stunting (WaSt) were acute respiratory infections, measles, exclusive breastfeeding, national health insurance ownership, KIA book ownership, antenatal care history, sanitation access, and residential area. This study can provide information on factors related to wasting stunting (WaSt) among children aged 6–23 months in Indonesia so that the government can plan programs and policies to address the WaSt problem in Indonesia. The limitations of this study do not examine the relationship between nutritional intake and WaSt because nutritional intake data is limited and not available in the 2022 SSGI data.

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