Journal of Social Research

P-ISSN: 2827-9832
E-ISSN: 2828-335x
http://ijsr.internationaljournallabs.com/index.php/ijsr

Factors Associated with Stunting Incidence Among Children Aged 0–59 Months in The Working Area of Kilasah Public Health Center, Serang City, Indonesia, 2023

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ABSTRACT

Stunting is a condition characterized by failure to thrive in children due to chronic malnutrition from the age of 0–59 months, marked by a nutritional status index (PB/U or TB/U) with a Z-score less than -2 SD, resulting in height not appropriate for age. The working area of the Kilasah Health Center has been designated as the LOKUS (Focus Location) of stunting and continues to record a high number of cases. This study aims to determine the factors associated with stunting incidence among children aged 0–59 months in the Kilasah Health Center area, Serang City, in 2023. An observational case-control design was used with questionnaires and observation sheets as research instruments. The sample included 88 respondents, divided equally between case and control groups, selected by purposive sampling. Univariate analysis showed that 84.1% of mothers had poor knowledge, 88.6% did not exclusively breastfeed, 36.4% lacked healthy latrines, and 93.2% lacked clean water facilities that met requirements. Bivariate analysis using the Chi-Square test showed significant associations with stunting incidence for maternal knowledge (Pv = 0.000), exclusive breastfeeding (Pv = 0.000), healthy latrines (Pv = 0.000), and clean water facilities (Pv = 0.013). The study emphasizes the need to improve maternal knowledge and household sanitation to reduce stunting prevalence in urban Indonesia. It recommends strengthening counseling using booklets or flip sheets on stunting prevention and the importance of nutritious food for toddlers.

Keywords: *Stunting, Toilet, Clean water, Toddlers.*

INTRODUCTION

The results of World Health Organization (WHO) data in 2020 indicate that, globally, 22% or 149.2 million children under the age of five are stunted. In Asia, this figure is even higher, reaching 53% of children under five, while in Africa, 41% experience similar conditions (UNICEF/WHO/World Bank Group, 2021). Asia is the region with the highest prevalence of stunting worldwide, with Southeast Asia occupying the second position—recording 83.6 million stunted children under five after South Asia, which reached 125.7 million children (Angraini et al., 2020).

Indonesia, as one of the developing countries, continues to face serious nutritional challenges, particularly stunting. Stunting is a chronic nutritional problem characterized by growth failure due to prolonged malnutrition among children aged 0–59 months. This condition is measured using the Body Length-for-Age (PB/U) or Height-for-Age (TB/U) index with a Z-score of less than -2 SD, indicating that the child's height does not correspond to their age (Sari et al., 2020).

The Ministry of Health of the Republic of Indonesia explained that children who experience stunting are at risk of physical and cognitive developmental barriers in the future (Lestari et al., 2024). The causative factors are varied, including poor maternal nutrition during pregnancy, inappropriate feeding practices, limited access to maternal and child health services, and poor sanitation (Tafese & Kebebu, 2017). In addition, low maternal knowledge

about nutrition and the importance of exclusive breastfeeding also contributes to the high rate of stunting (Ministry of Health of the Republic of Indonesia, 2018).

Maternal knowledge of nutrition is an important factor in stunting prevention (Emaniar et al., 2023). Many mothers do not understand the signs of malnutrition and the long-term impact of stunting, leading to insufficient attention to nutritional intake during the golden period of child growth and development, particularly before the age of two years. This low level of knowledge is often associated with limited educational attainment among mothers (Sutriyawan & Nadhira, 2020).

Several studies have demonstrated a significant relationship between maternal knowledge and stunting incidence. For example, research by Sastria et al. (2019) in Sidrap Regency found that mothers with poor knowledge had more stunted toddlers (26.9%) compared to mothers with sufficient knowledge (11.5%). These findings emphasize the importance of nutrition education for mothers of children under five to reduce stunting prevalence.

In addition to knowledge, exclusive breastfeeding plays a major role in stunting prevention (Sari, 2022). Breast milk provides complete nutrients essential for babies up to six months of age without additional food or liquids (Mufdlilah, 2017). Toddlers who are not exclusively breastfed have a 98% higher risk of stunting. Research by Anita Sampe et al. (2020) supports these findings, showing that children who are not exclusively breastfed have up to 6.1 times greater risk of stunting.

Sanitation factors are equally important in preventing stunting. Access to hygienic latrines and clean water has been shown to correlate with stunting rates (Kwami et al., 2019). Households that still practice open defecation (BABS) are at higher risk of diarrhea, intestinal worms, and gastrointestinal damage leading to malnutrition (Kurniawati, 2020). Research by Simanuhuruk et al. (2023) revealed that children under five from families without healthy latrines are 6.6 times more likely to experience stunting.

This situation is also reflected in Banten Province, which ranks among the top five provinces with the highest stunting rates in Indonesia. Data from the 2021 Indonesian Toddler Nutrition Status Survey (SSGBI) recorded 294,862 stunted toddlers in Banten. Although the prevalence decreased from 24.5% in 2021 to 20% in 2022, some regions, such as Serang City, still reported high rates of 23.8% in 2022 (Ministry of Health of the Republic of Indonesia, 2022). Moreover, data from the Kilasah Health Center in 2023 show that 6.28% of toddlers remain in the short and very short categories. This situation underscores the need to strengthen stunting prevention efforts through comprehensive interventions, including improving maternal education, promoting exclusive breastfeeding, and expanding access to healthy latrines and clean water.

Despite the well-documented correlations among maternal knowledge, breastfeeding practices, and sanitation with stunting in rural settings, there remains a significant research gap in understanding these determinants within urban Indonesian communities. Previous studies have predominantly focused on rural populations, where access to health facilities and clean water infrastructure differs substantially from urban contexts (Sastria et al., 2019; Hasan & Kadarusman, 2019). Research by Setiawan et al. (2018) examined stunting factors in Padang City but did not comprehensively assess the combined impact of maternal knowledge, exclusive breastfeeding, and environmental sanitation factors. Similarly, while Sinatrya et al.

(2019) investigated WASH (Water, Sanitation, and Hygiene) factors related to stunting, their study was conducted in Bondowoso Regency, a predominantly rural area, thus limiting its applicability to urban contexts. Ambarwati et al. (2020) identified risk factors for stunting in Tanjung Jabung Timur but did not adopt a case-control design capable of establishing stronger causal inferences. This gap is particularly relevant considering that urban areas face distinct challenges, including higher population density, different sanitation infrastructure, and varied socioeconomic conditions that may influence stunting patterns differently from rural areas.

Unlike prior studies focusing predominantly on rural areas, this research investigates urban community factors influencing stunting, thereby expanding the understanding of localized interventions needed within Indonesia's diverse geographical and socioeconomic landscape. This contribution is particularly timely, given Indonesia's rapid urbanization and the increasing need for context-specific stunting prevention strategies.

The novelty of this study lies in three key aspects. First, it specifically examines stunting determinants in an urban health center setting (Kilasah, Serang City), contributing to the limited evidence base on urban stunting in Indonesia. Second, it employs a rigorous case-control design that allows for the calculation of odds ratios, providing stronger evidence of risk factor associations compared to cross-sectional studies. Third, it comprehensively analyzes multiple determinants simultaneously—maternal knowledge, exclusive breastfeeding practices, latrine ownership, and clean water access—within the same urban population, enabling a holistic understanding of the multifactorial nature of stunting in this context.

The incidence of stunting in Serang City, particularly in the working area of the Kilasah Health Center, remains a serious issue despite various preventive efforts. This situation underlines the formulation of the research problem: what factors are associated with the incidence of stunting among children aged 0–59 months? The primary objective of this study is to identify and quantify the associations between maternal knowledge, exclusive breastfeeding, latrine ownership, and the availability of clean water facilities with stunting incidence among children aged 0–59 months. Specific objectives include: (1) identifying the distribution of stunting events based on maternal knowledge, breastfeeding practices, latrine ownership, and access to clean water facilities, and (2) analyzing the strength of the association between these variables and stunting occurrence through odds ratio calculations.

The benefits of this research are multifaceted. Academically, this study enriches the literature at Faletehan University and contributes to the broader scientific understanding of stunting determinants in urban Indonesian settings, potentially guiding future research directions. Practically, the findings serve as an evidence-based evaluation reference for the UPTD Kilasah Health Center and relevant government agencies in Serang City, supporting the development of targeted stunting reduction interventions. The calculated odds ratios offer quantitative evidence to prioritize preventive strategies based on the magnitude of associated risks. For the research team, this study provides valuable field experience in analytical epidemiological methods, enhancing competencies in public health research and data analysis.

The theoretical implications of this research validate the applicability of existing stunting frameworks—particularly UNICEF's conceptual framework on malnutrition—within the urban Indonesian context. Practically, the findings have significant policy relevance, guiding local health promotion campaigns focused on maternal nutrition education, breastfeeding support programs, and environmental sanitation improvements. Furthermore, by

demonstrating the relative contributions of each factor to stunting risk, this study supports evidence-driven resource allocation to maximize the public health impact of stunting prevention efforts.

METHOD

This research employed an observational analytic method with a quantitative case-control study design. The method identified case and control groups and retrospectively examined risk factors associated with stunting (Notoatmodjo, 2018).

The study aimed to determine the relationship between maternal knowledge, exclusive breastfeeding, healthy latrine ownership, and clean water use with stunting incidence among children aged 0–59 months in the working area of the Kilasah Health Center, Serang City. The case group consisted of stunted toddlers, while the control group comprised non-stunted toddlers. This comparison was intended to identify the dominant risk factors contributing to stunting.

The study was conducted in the working area of the Kilasah Health Center, Kasemen District, Serang City, from May to July 2023. The population included 120 stunted toddlers and 1,912 non-stunted toddlers. A total of 88 respondents were selected, consisting of 44 toddlers in each group.

Sampling was conducted using the purposive sampling method based on predetermined inclusion criteria. The case group included toddlers aged 0–59 months who resided within the Kilasah Health Center area, were officially recorded as stunted, and whose parents consented to participate. The control group had similar criteria but consisted of toddlers who were not stunted.

Data collection used both primary and secondary data. Primary data were obtained through questionnaires and observations on maternal knowledge, breastfeeding practices, latrine ownership, and clean water access. Secondary data were collected from the Serang City Health Office, Kilasah Health Center records, and previous studies. Data processing involved editing, coding, tabulation, and cleaning to ensure accuracy before statistical analysis using SPSS (Notoatmodjo, 2018).

RESULTS AND DISCUSSION

Univariate Analysis

Distribution of the frequency of stunting incidence in children aged 0-59 months based on the knowledge of mothers in the working area of the Kilasah Health Center in 2023.

Table 1. Distribution of the Frequency of Stunting Incidence in Children Aged 0-59 Months Based on Mother's Knowledge

Mother's Knowledge	Stunting Incidence				Total	
	Case		Control			
	N	%	N	%	N	%
Less good	37	84,1%	18	40,9%	55	62,5%
Good	7	15,9%	26	50,1%	33	37,5%
Total	44	100,0%	44	100,0%	88	100,0%

Source: Primary Data, 2023

Based on table 1, it can be seen from 44 respondents in the case group, the results were obtained as many as 37 (84.1%) respondents had poor knowledge and as many as 7 (15.9%) respondents had good knowledge. Meanwhile, from 44 respondents in the control group, the results were obtained as many as 18 (40.9%) respondents who had poor knowledge and as many as 26 (50.1%) respondents had good knowledge.

Distribution of the frequency of stunting incidence in children aged 0-59 months based on exclusive breastfeeding in the working area of the Kilasah Health Center in 2023.

Table 2. Distribution of Frequency of Stunting Incidence in Children Aged 0-59 Months Based on Exclusive Breastfeeding

Exclusive Breastfeeding	Stunting Incidence				Total	
	Case		Control			
	N	%	N	%	N	%
Exclusive Breast Milk	39	88,6%	10	22,7%	49	55,7%
Exclusive Breast Milk	5	11,4%	34	77,3%	39	44,3%
Total	44	100,0%	44	100,0%	88	100,0%

Source: Primary data, 2023

Based on table 2, it can be seen from 44 respondents in the case group, the results were obtained as many as 39 (88.6%) respondents who did not give exclusive breastfeeding and as many as 5 (11.4%) respondents gave exclusive breastfeeding. Meanwhile, from 44 respondents in the control group, the results were obtained as many as 10 (22.7%) respondents who did not give exclusive breastfeeding and as many as 34 (77.3%) respondents gave exclusive breastfeeding.

Distribution of the frequency of stunting incidence in children aged 0-59 months based on the ownership of healthy latrines in the working area of the Kilasah Health Center in 2023

Table 3. Distribution of the frequency of stunting incidence in children aged 0-59 months based on healthy toilet ownership

Ownership of Healthy Latrines	Stunting Incidence				Total	
	Case		Control			
	N	%	N	%	N	%
Have no	16	36,4%	1	2,3%	17	19,3%
Have	28	63,6%	43	97,7%	71	80,7%
Total	44	100,0%	44	100,0%	88	100,0%

Source: Primary Data, 2023

Based on table 3, it can be seen from 44 respondents in the case group, the results were obtained as many as 16 (36.4%) respondents who did not have qualified latrines and as many as 28 (63.6%) respondents who had qualified latrines. Meanwhile, from 44 respondents in the control group, the results were obtained as many as 1 (2.3%) of respondents did not have qualified latrines and as many as 43 (97.7%) respondents had qualified latrines.

Distribution of the frequency of stunting incident in children aged 0-59 months based on the availability of clean water facilities in the working area of the Kilasah Health Center in 2023

Table 4. Distribution of the frequency of stunting incidence in children aged 0-59 months based on the availability of clean water facilities

Availability of Clean Water Facilities	Stunting Incidence				Total	
	Case		Control			
	N	%	N	%	N	%
Not eligible	41	93,2%	31	70,5%	72	81,8%
Meet condition	3	6,8%	13	29,5%	16	18,2%
Total	44	100,0%	44	100,0%	88	100,0%

Source: Primary data, 2023

Based on table 4, it can be seen from 44 respondents in the case group, the results were obtained as many as 41 (93.2%) respondents who had unqualified clean water facilities and as many as 3 (6.8%) respondents had qualified clean water facilities. Meanwhile, of the 44 respondents in the control group, the results were obtained as many as 31 (70.5%) respondents had unqualified clean water facilities and as many as 13 (29.5%) respondents had qualified clean water facilities.

Bivariate Analysis

The relationship between maternal knowledge and the incidence of stunting in children aged 0-59 months in the working area of the Kilasah Health Center in 2023

Table 5. Relationship between maternal knowledge and the incidence of stunting in children aged 0-59 months

Mother's Knowledge	Stunting Incidence				Total		P value	OR
	Case		Control					
	N	%	N	%	N	%		
Less good	37	84,1%	18	40,9%	55	62,5%	0,000	7,635
Good	7	15,9%	26	50,1%	33	37,5%		
Total	44	100,0%	44	100,0%	88	100,0%		

Source: Primary data, 2023

Based on the results of the analysis using the Chi Square test, it shows that P value = 0.000 (Pv < α) which means that the P value is smaller than α (0.05), it can be concluded that statistically at α 5% there is a meaningful relationship between maternal knowledge and the incidence of stunting in children aged 0-59 months in the working area of the Kilasah Health Center, Serang City in 2023. And from the results of the calculation, the Odd Ratio value was obtained showing that respondents who had poor knowledge had a 7.635 times greater risk of experiencing stunting compared to respondents who had good knowledge.

The relationship between exclusive breastfeeding and the incidence of stunting in children aged 0-59 months in the working area of the Kilasah Health Center in 2023

Table 6. Relationship between exclusive breastfeeding and stunting incidence in children aged 0-59 months

Exclusive Breastfeeding	Stunting Incidence				Total		P value	OR
	Case		Control					
	N	%	N	%	N	%		
Not Breast Milk Exclusive	39	88,6%	10	22,7%	49	55,7%	0,000	26,520
ABOUT Exclusive	5	11,4%	34	77,3%	39	44,3%		
Total	44	100,0%	44	100,0%	88	100,0%		

Source: Primary data, 2023

Based on the results of the analysis using the Chi Square test, it shows that P value = 0.000 (Pv < α) which means that the P value is less than α (0.05), it can be concluded that statistically at α 5% there is a significant relationship between exclusive breastfeeding and the incidence of stunting in children aged 0-59 months in the working area of the Kilasah Health Center, Serang City in 2023. And from the results of the calculation, an Odd Ratio value was obtained, which means that respondents who did not give exclusive breastfeeding had a 26,520 times greater risk of experiencing stunting compared to respondents who gave exclusive breastfeeding.

The relationship between healthy toilet ownership and the incidence of stunting in children aged 0-59 months in the working area of the Kilasah Health Center in 2023

Table 7. Relationship between healthy toilet ownership and stunting incidence in children aged 0-59 months

Possession of Healthy Latrines	Stunting Incidence				Total		P *value*	OR
	Case		Control					
	N	%	N	%	N	%		
No have	16	36,4%	1	2,3%	17	19,3%	0,000	24,571
Have	28	63,6%	43	97,7%	71	80,7%		
Total	44	100,0%	44	100,0%	88	100,0%		

Source: Primary data, 2023

Based on the results of the analysis using the Chi Square test, it shows that P value = 0.000 (Pv < α) which means that the P value is smaller than α (0.05), it can be concluded that statistically at α 5% there is a significant relationship between healthy toilet ownership and the incidence of stunting in children aged 0-59 months in the working area of the Kilasah Health Center, Serang City in 2023. And from the results of the calculation, an Odd Ratio was obtained, which means that respondents who do not have healthy latrines have a 24.571 times greater risk of experiencing stunting compared to respondents who have healthy latrines.

The relationship between the availability of clean water facilities and the incidence of stunting in children aged 0-59 months in the working area of the Kilasah Health Center in 2023

Table 8. Relationship between the availability of clean water facilities and the incidence of stunting in children aged 0-59 months

Clean Water Facilities	Stunting Incidence				Total		P value	OR
	Case		Control					
	N	%	N	%	N	%		
Not compliant condition	41	93,2%	31	70,5%	72	81,8%	0,013	5,731
Qualify	3	6,8%	13	29,5%	16	18,2%		
Total	44	100,0%	44	100,0%	88	100,0%		

Source: Primary data, 2023

Based on the results of the analysis using the Chi Square test, it shows that P value = 0.013 (Pv < α) which means that the P value is smaller than α (0.05), it can be concluded that statistically at α 5% there is a significant relationship between unqualified clean water facilities and the incidence of stunting in children aged 0-59 months in the working area of the Kilasah Health Center, Serang City in 2023. And from the results of the calculation, an Odd Ratio was obtained, which means that respondents who have unqualified clean water facilities have a 5,731 times greater risk of experiencing stunting compared to respondents who have qualified clean water facilities.

Distribution of the frequency of stunting incidence in children aged 0-59 months based on the knowledge of mothers in the work area of the Kilasah Health Center in 2023

Knowledge is something that is known by a person related to health, illness or health. Everyone has different knowledge depending on each individual's perception of something (Notoatmojo, 2018). Based on the results of the cross-table analysis between maternal knowledge and the incidence of stunting in children aged 0-59 months in the working area of the Kilasah Health Center, Serang City in 2023, respondents in the case group obtained results of 37 (84.1%) respondents who had less good knowledge than the control group, namely 18 (40.9%) respondents. This shows that respondents who have poor knowledge have a greater risk of stunting than mothers under five who have good knowledge. This is in line with the research of Sastria et al (2019) with the title Factors of stunting incidence in children and toddlers in the working area of the Lawawoi Health Center, Watang Pulu District, Sidrap Regency, where in the case group with poor knowledge the number was more (26.9%) than the control group, namely (11.5%) respondents.

Poor knowledge in mothers under five is caused by the number of respondents who have low education, namely elementary school as many as 79.5% of respondents and also the lack of information related to nutrition and stunting obtained so that mothers with low education do not know how children experience stunting and the impact that will be caused on toddlers who experience stunting and the lack of knowledge of mothers about nutritious toddler food. Basically, education is closely related to knowledge, a higher level of education will make it easier for a person to absorb information and implement it in daily behavior and lifestyle, especially in terms of health.

Distribution of the frequency of stunting incidence in children aged 0-59 months based on exclusive breastfeeding in the working area of the Kilasah Health Center in 2023

According to Government Regulation Number 33 of 2012, Exclusive Breast Milk is breast milk given to babies from birth for 6 (six) months, without adding and/or replacing it with other foods or drinks except drugs and vitamins. Based on the results of the cross-table analysis between exclusive breastfeeding and the incidence of stunting in children aged 0-59 months in the working area of the Kilasah Health Center, Serang City in 2023, respondents in the case group obtained results of 39 (88.6%) more respondents who did not exclusively breastfeed than the control group, namely 10 (22.7%) respondents. This shows that toddlers who do not exclusively breastfeed have a greater risk of stunting than toddlers who are given exclusive breastfeeding.

This is in line with research conducted (Latifah et al., 2020) that there is a meaningful relationship between exclusive breastfeeding and the incidence of stunting in toddlers aged 1-5 years in Posyandu Bangunsari In the work area of the Pulung Health Center. Exclusive breast milk contains antibodies that can increase the baby's immune system so that the baby does not get sick easily such as diarrhea. When the baby is sick the fulfillment of nutrients will be disturbed so that it can cause an imbalance of nutrients and can cause the child to experience stunting (Latifah et al., 2020).

Some of the factors that cause children to not breastfeed exclusively in the work area of the Kilasah Health Center in 2023 include a lack of information about the extent of the benefits of exclusive breastfeeding, lack of knowledge so that mothers do not have a fundamental belief in the meaning of exclusive breastfeeding, and low education of respondents which results in a lack of basic thinking skills to make a decision, especially in exclusive breastfeeding.

Distribution of the frequency of stunting incidence in children aged 0-59 months based on the ownership of healthy latrines in the work area of the Kilasah Health Center in 2023

A toilet is a building used for throwing and collecting human feces or feces, commonly called a toilet / toilet. So that the dirt will be stored in a certain place and will not be the cause or spread of diseases and pollute the residential environment (Ministry of Health of the Republic of Indonesia, 2003). Based on the results of the cross-table analysis between the ownership of healthy latrines and the incidence of stunting in children aged 0-59 months in the working area of the Kilasah Health Center, Serang City in 2023, respondents in the case group obtained results of 16 (36.4%) more respondents who did not have healthy latrines compared to the control group, namely 1 (2.3%) respondents. This shows that households that do not Having a healthy latrine has a greater risk of stunting incidence than households that have healthy latrines.

This is in line with the results of research by Amrul Hasan & Haris Kadarusman (2019) obtained results, which is related to access to healthy toilet ownership in households, which means that toddlers whose families do not have access to healthy toilet ownership are at risk of stunting 5.25 times compared to toddlers whose families have access to healthy toilet ownership.

The availability of latrines that meet health requirements is important in determining the respondent's defecation behavior, if the respondent has a healthy latrine facility and uses the latrine facility properly, it will reduce the risk of the respondent to defecate indiscriminately (BABS). Careless defecation behavior (BABS) can pollute the environment and make disease carriers that land from feces through food and drink can cause diarrhea, especially in toddlers which can interfere with growth and development, resulting in stunting. From the results of interviews and observations of the types of latrines owned in the work area of the Kilasah Health Center, Serang City in 2023, most of the respondents have latrines with a gooseneck type, 71 (80.7%) respondents

Distribution of the frequency of stunting incidence in children aged 0-59 months based on the availability of clean water facilities in the work area of the Kilasah Health Center in 2023

Water is very important for humans because it plays a lot of roles in human life. Clean water is widely used for daily purposes such as drinking, cooking, washing, bathing, etc. In fact, humans will die faster from lack of water than from lack of food (Marlinae, et al., 2019). Based on the results of the cross-table analysis between the availability of clean water facilities and the incidence of stunting in children aged 0-59 months in the working area of the Kilasah Health Center, Serang City in 2023, respondents in the case group obtained results of 41 (93.2%) respondents who had unqualified clean water facilities compared to the control group, namely 31 (70.5%) respondents. This shows that households that have unqualified clean water facilities have a greater risk of stunting than households that have qualified clean water facilities.

This is in line with the research of Sinatrya., et al (2019), stating that clean water sources that are not protected and not physically qualified are related to the incidence of stunting in children. Clean water sources in the unprotected category in question are from rivers, wells, and rainwater reservoirs (PAH). This states that water that is included in the unprotected category can cause health problems for individuals, one of which is children experiencing diarrhea. Diarrhea that occurs in children under five years can also hinder children from achieving their growth abilities.

Water is an important need for humans for daily life. Clean water that does not meet health requirements is certainly at risk of causing various diseases such as diarrhea, thypus, hepatitis and others. Every family must have the availability of clean water facilities that meet health requirements to maintain the health of their families, including their toddlers, so that they can grow and develop optimally. From the results of interviews and observations of clean water sources used in the work area of the Kilasah Health Center in Serang City in 2023, most of the respondents used drilled/sanyo wells with a percentage of 55.7%, river water 43.2% and PDAM water 1.1%.

Bivariate Analysis

The relationship between maternal knowledge and the incidence of stunting in children aged 0-59 months in the working area of the Kilasah Health Center in 2023

According to Notoatmodjo in Naomi (2019), knowledge is the result of "knowing" and this happens after people feel a certain object. Senses occur through the five senses, namely:

the senses of sight, hearing, smell, taste and touch. Most of human knowledge is acquired by eyes and ears. Based on the results of cross-tabulation between maternal knowledge and the incidence of stunting in children aged 0-59 months in the working area of the Kilasah Health Center, Serang City in 2023, from 44 respondents in the case group, 37 (84.1%) respondents with poor knowledge were obtained compared to 44 respondents from the control group, namely 18 (40.9%) respondents with poor knowledge.

From the results of bivariate analysis statistically using the Chi Square test at α 5%, a P value of 0.000 was obtained, which means that the P value was smaller than α (0.05). Therefore, it can be concluded that there is a meaningful relationship between knowledge and the incidence of stunting in children aged 0-59 months in the working area of the Kilasah Health Center, Serang City in 2023, and an Odd Ratio (OR) value was obtained, which means that respondents who have poor knowledge have a risk of 7,635 times more are more likely to experience stunting than respondents who have good knowledge.

The results of this study are in line with the research of Hasnawati, et al (2021) showing that the incidence of stunting in toddlers aged 12-59 months is closely related to the level of knowledge of mothers. The results of the study showed that stunting in toddlers with a very short category was dominated by mothers with less category knowledge as much as 70%. The incidence of stunting was dominated by toddlers in the very short category, out of a total of 30 toddlers (100%). The results of the study were obtained using the chi-square test and the value obtained was p = 0.02. This states that the p-value is smaller than α (0.05).

Based on the results of interviews with questionnaires, it shows that mothers who have poor knowledge and stunted toddlers are mostly due to low educational backgrounds. Low education can make it more difficult for parents to receive information from outside, especially in maintaining their children's health about nutrition and stunting problems. Finally, it causes parents (mothers) to be less concerned about the intake of nutritious food for toddlers and most importantly for them to provide food for children and ignorance about the impact that will be caused if children experience stunting.

Whether or not a person's knowledge depends on the willingness of a person to seek information about the impact caused by stunting on toddlers. In mothers who have good knowledge, but their children experience stunting due to parenting of children, especially poor diets, so that they do not meet the nutritional status of toddlers and cause stunting.

The relationship between exclusive breastfeeding and the incidence of stunting in children aged 0-59 months in the working area of the Kilasah Health Center in 2023

Breast milk is the best food to meet the nutritional needs of babies for optimal growth and development. Exclusive breastfeeding starts from 1 hour (Early Breastfeeding Initiation (IMD) after birth until 6 months of age. Breast milk contains nutrients that are most suitable to meet the nutritional needs of babies who are developing and developing. Breast milk is easily digested, absorbed and used efficiently by the baby's body. Breast milk protects the baby from the occurrence of infection. Healthy babies will experience maximum growth acceleration between the ages of 0-6 months (ASDI, IDAI, and PERSAGI.2017).

Based on the results of cross-tabulation between exclusive breastfeeding and the incidence of stunting in children aged 0-59 months in the working area of the Kilasah Health Center, Serang City in 2023, from 44 respondents in the case group, 39 (88.6%) respondents

who did not breastfeed Exclusive obtained more results compared to 44 respondents from the control group obtained as many as 10 (22.7%) respondents who did not breastfeed Exclusively.

From the results of bivariate analysis statistically using the Chi Square test at α 5%, a P value of 0.000 was obtained, which means that the P value was smaller than α (0.05). Therefore, it can be concluded that there is a meaningful relationship between exclusive breastfeeding and the incidence of stunting in children aged 0-59 months in the working area of the Kilasah Health Center, Serang City in 2023, and an Odd Ratio (OR) value was obtained, which means that respondents who do not breastfeed exclusively have a 26.520 times chance of experiencing stunting compared to respondents who breastfeed exclusively.

The results of this study are in line with research conducted by Anita Sampe, et al in 2020 regarding the relationship between exclusive breastfeeding in toddlers with the incidence of stunting, with the results of the study stating that out of 72 children who became respondents, there were 66 children who experienced stunting due to the fact that toddlers were not given exclusive breastfeeding. Based on the research conducted, it was obtained that the OR value = 61 means that toddlers who are not given exclusive breastfeeding are 61 times more likely to experience stunting than toddlers who are given exclusive breastfeeding. Then, toddlers who are not given exclusive breastfeeding have a 98% chance of stunting. It can be concluded that the low level of exclusive breastfeeding is one of the triggers for stunting in children under five. Exclusive breastfeeding is a protective factor against the incidence of stunting in toddlers so that exclusive breastfeeding can reduce the incidence of stunting.

Based on the results of interviews with children who are stunted, most of them have a history of not being given exclusive breastfeeding, this is influenced by several factors, including due to the low educational background of mothers, namely elementary school graduates, lack of knowledge, poor maternal nutritional intake during breastfeeding, and minimal family support.

The relationship between healthy toilet ownership and the incidence of stunting in children aged 0-59 months in the working area of the Kilasah Health Center in 2023

A toilet is a room that has a human waste disposal facility consisting of a squat or seat with a goose neck or without a goose neck (cemplung) which is equipped with a feces and water collection unit to clean it (Siregar, 2018). Based on the results of cross-tabulation between the ownership of healthy latrines and the incidence of stunting in children aged 0-59 months in the working area of the Health Center. In 2023, out of 44 respondents in the case group, 16 (36.4%) respondents did not have qualified latrines, compared to the control group of 44 respondents, namely 1 (2.3%) respondent did not have qualified latrines.

From the results of bivariate analysis statistically using the Chi Square test at α 5%, a P value of 0.000 was obtained, which means that the P value was smaller than α (0.05). Therefore, it can be concluded that there is a significant relationship between the ownership of healthy latrines and the incidence of stunting in children aged 0-59 months in the working area of the Kilasah Health Center, Serang City in 2023, and an Odd Ratio (OR) value was obtained, which showed that respondents who did not have healthy latrines were 24,571 times more likely to experience stunting than respondents who had healthy latrines. The results of this study are in line with the research of Amrul Hasan & Haris Kadarusman (2019) obtained results, which is related to access to healthy toilet ownership in households, which means that

toddlers whose families do not have access to healthy toilet ownership are at risk of stunting 5.25 times compared to toddlers whose families have access to healthy toilet ownership.

From the results of interviews and observations, families who do not have latrines prefer to defecate in rivers/rivers/gardens and there are some who ride in latrines owned by their neighbors. There are also families who have latrines but do not have a septic tank fecal container that only distributes using pipes directed to the river, this is the same as families who do not have healthy latrines and still defece indiscriminately (BABS). Latrine facilities that do not meet the requirements and healthy standards have the potential to trigger the onset of infectious diseases due to poor hygiene and sanitation such as diarrhea and worms that can interfere with the absorption of nutrients in the digestive process. Some infectious diseases suffered by toddlers can cause children to lose weight and if they occur for a long time, they will result in stunting. In families that have healthy latrines, their children experience stunting due to poor healthy and clean-living behaviors such as not washing hands after defecating, processing and giving children food, poor maternal knowledge and parenting.

The relationship between the availability of clean water facilities and the incidence of stunting in children aged 0-59 months in the working area of the Kilasah Health Center in 2023

Regulation of the Minister of Health No. 32 of 2017 states that water refers to environmental quality standards and health water media for sanitation and hygiene purposes, including biological, physical, and chemical parameters, with mandatory and additional parameters including maintaining personal hygiene such as bathing in water for hygiene purposes, brushing teeth, washing food, and washing dishes and clothes. In addition, raw materials for drinking water can also use water for sanitation purposes.

Based on the results of the cross-tabulation of the availability of clean water with the incidence of stunting in children aged 0-59 months in the working area of the Kilasah Health Center, Serang City in 2023, from 44 respondents in the case group, the results were obtained as many as 41 (93.2%) respondents, more than the control group of 44 respondents, namely 31 (70.5%) respondents had unqualified clean water facilities.

From the results of the bivariate analysis statistically using the Chi Square test at α 5%, a P value of 0.013 was obtained, which means that the P value was smaller than α (0.05). Therefore, it can be concluded that there is a meaningful relationship between clean water facilities and the incidence of stunting in children aged 0-59 months in the working area of the Kilasah Health Center in Serang City in 2023, and the results of the Odd Ratio (OR) calculation show that respondents who do not have clean water facilities have a 5,731 times chance of experiencing stunting compared to respondents who have access to clean water facilities.

The results of this study are in line with the research of Sinatrya., et al (2019), stating that clean water sources that are not protected and are not physically qualified are related to the incidence of stunting in children. Clean water sources in the unprotected category in question are from rivers, wells, and rainwater reservoirs (PAH). This states that water that is included in the unprotected category can cause health problems for individuals, one of which is children experiencing diarrhea. Diarrhea that occurs in children under five years can also hinder children from achieving their growth abilities.

Based on the results of interviews and observations, families who have clean water facilities but do not meet the requirements and experience stunting, some choose to use river/river water for daily purposes such as bathing, washing clothes, and defecating. There are several families who have and use well water, but the distance between the water source and the septic tank is close so that it is not in accordance with the requirements and physical health standards of clean water (> 10 meters). Clean water facilities that do not meet health requirements, poor environmental sanitation can cause toddlers to suffer from diarrhea/worm diseases and have an impact on toddlers losing nutrients that are important for growth so as to cause stunting.

In families who have qualified clean water facilities, but their children are stunted, it can be caused by factors Mothers' knowledge about stunting and poor feeding parenting such as lack of attention to hygiene in processing and feeding for their families, especially toddlers, thus affecting children experiencing stunting.

The availability of clean water has a great influence on the occurrence of stunting in toddlers because clean water is used in daily life such as drinking, cooking, bathing, and washing. Water is very easily contaminated with pathogenic bacteria if it is not managed properly, such as not being cooked to boil and the containers used to store drinking water are not clean and not closed. The water, if consumed, can cause digestive system disorders such as diarrhea, thyroid, cholera, dysentery, and so on (Ministry of Health of the Republic of Indonesia, 2016). Toddlers who are in the growth period, if they consume the water repeatedly, can inhibit their growth and development, because energy from food intake is diverted to fight infections so that the growth and development of toddlers is not optimal (Desyanti and Nindya, 2017)

CONCLUSION

The study concluded that stunting among children aged 0–59 months in the Kilasah Public Health Center area was significantly associated with poor maternal knowledge, non-exclusive breastfeeding, lack of healthy latrines, and inadequate clean water access. High odds ratios for non-exclusive breastfeeding (OR = 26.520) and lack of healthy latrines (OR = 24.571) indicated that infant feeding practices and environmental sanitation were primary determinants of stunting, highlighting its multifactorial nature rooted in caregiving, nutrition, and environmental factors. These findings suggest that integrated interventions combining nutrition education, breastfeeding promotion, and sanitation infrastructure are essential to reduce stunting prevalence. Future research should adopt longitudinal or quasi-experimental designs to strengthen causal inference and evaluate the effectiveness of targeted interventions, while also examining additional factors such as dietary diversity, family income, and maternal nutrition. Qualitative studies exploring socio-cultural influences on breastfeeding and sanitation behaviors are also recommended to inform context-specific public health strategies.

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