



The Relationship between Stunting and the Development of Toddlers Aged 24-60 Months in Kertomulyo Village, Brangsong District, Kendal Regency

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Received: February 28, 2025; Revised: March 11, 2025; Accepted: January 30, 2026

ABSTRACT

Realizing the golden generation of 2045 is Indonesia's dream at the age of 100 years by giving birth to a quality next generation. Alleviating the stunting problem is an important key to realizing this dream. Data shows that Indonesia is the country with the highest stunting rate in Asia and the reduction in stunting rate to 14% in 2024 is still far from the target. Stunting can affect children's growth and development, such as fine motor disorders, gross motor disorders, speech and language, as well as socialization and independence.

The purpose of this study is to determine the relationship between stunting and the development of toddlers aged 24-60 months in Kertomulyo, Brangsong, Kendal.

The research was conducted in May 2024 in Kertomulyo, Brangsong, Kendal. This research uses a type of analytical observational research with a cross-sectional research design. The population of this study is all toddlers aged 24-60 months. The sampling technique uses the proportional stratified random sampling technique. All samples were measured in height and checked for development using KPSP.

The results of the research showed that from 72 toddlers, 23 toddlers (31.9%) were stunted, while 49 toddlers (68.1%) had their development in the appropriate category. There is a relationship between stunting and the development of toddlers aged 24-60 months in Kertomulyo, Brangsong, Kendal, with a p value of $0.000 < 0.05$.

The results of this research are expected to be parents of toddlers diligent in monitoring their growth and development regularly, especially in toddlers who are stunted, need to be sure to get a balanced and nutritious diet, and can stimulate their development more often with affection.

Keywords: stunting; toddler development

Introduction

Achieving a golden generation in 2045 is a dream for Indonesia at the age of 100 years. It is hoped that Indonesia can take advantage of the demographic bonus opportunity by giving birth to a quality, healthy, intelligent, creative and competitive next generation. The key to realizing this dream is to ensure that the nation's future generations are free from stunting. In 2021, the Indonesian government declared stunting a national priority and issue, as stated in the mandate of Presidential Decree Number 72 of 2021 [25].

This regulation is a follow-up to Presidential Decree Number 42 of 2013 concerning the National Movement for the Acceleration of Nutrition Improvement. The Government's efforts to overcome this problem began by including stunting in the 2020-2024 RPJMN. The President of the Republic of Indonesia has appointed the National Population and Family Planning Agency (BKKBN) under the coordination of the Minister of Human Development and Culture to coordinate the implementation of the stunting alleviation program in Indonesia [44].

Stunting is a global problem that can increase morbidity and mortality rates, as well as increase the risk of metabolic disease in adulthood [30]. According to the Ministry of Health's definition, stunting is a growth and development disorder in children which is characterized by a z-score value in the height-for-age (TB/U) category of less than -2 SD [8].

Stunting can occur while the fetus is still in the womb because the food consumed by the mother during pregnancy is lacking in nutritional value. Malnutrition can inhibit fetal growth and continue after birth. Symptoms of stunting usually appear when the child is 2 years old [12]. According to the Indonesian Ministry of Health, the first thousand days of life are a critical period that determines the quality of life. Malnutrition that is not treated within 1000 HPK can have serious short-term impacts [15].

According to the World Health Organization, 165 million children under the age of five or more than 25% experienced stunting in 2018 [21]. Compared to several countries in Asia, Indonesia has the highest stunting rate in children under five, namely 37.2%, followed by Myanmar at 35%, Vietnam at 23%, Malaysia at 17%, Thailand at 16%, and Singapore at 4% [3]. Indonesia is one of 17 out of 117 countries that has three nutritional challenges, namely stunting, wasting and overweight in children under five [42].

Based on the results of the Indonesian Nutrition Status Survey (SSGI) conducted by the Indonesian Ministry of Health, in 2019 the prevalence of stunting in toddlers was 27.7%. In 2021, the prevalence of stunting in toddlers will decrease to 24.4%. According to SSGI, the prevalence of stunting under five children will decrease again to 21.6% in 2022 and in 2023 it will only decrease by 0.1% from the previous year, namely 21.5% [6]. However, the stunting reduction target in Indonesia is estimated to still decrease significantly to 14% in 2024 [45].

According to SSGI results, stunting in Central Java in 2022 will be at 20.8% or around 540,000 children will experience stunting. Head of the Central Java Province BKKBN, Widwiono, said that the stunting target for Central Java per year is 3.5%, meaning that by the end of 2022 the figure will reach 17.4% and by the end of 2023 it will be 14%. The central government's target is 14% in 2024, therefore Central Java is targeting one year more progress, namely reaching 14% in 2023 [9].

Based on the decision of the Minister of National Development Planning/Head of Bappenas No. KEP. 101/M.PPN/HK/06/2022 concerning Determining Districts/Cities Focus Locations for Interventions for Accelerating Integrated Stunting Reduction in 2023, Kendal Regency is one of 30 districts/cities in Central Java with a stunting prevalence of 27% for toddlers [7]. The Kendal District Health Service recorded 5,017 cases of stunting in children under the age of five [11].

Meanwhile, as many as 172 toddlers in the Brangsong 1 Community Health Center area are still experiencing stunting [11]. According to the explanation of Meriati Aritonang, A. Md. Gz, stunting in the Brangsong 1 Community Health Center area is caused by low socio-economic conditions. Socio-economic conditions, such as income and number of family members, are related to the ability to meet the quality and quantity of nutritional intake and health services, especially for pregnant women and toddlers. Families who have financial limitations will find it difficult to meet their family's food needs. If this situation is not addressed, it will affect the child's growth and development.

According to WHO, stunting can cause disruption in the development of fine motor skills, gross motor skills, speech and language, as well as socialization and independence. Fine motor skills are a developmental aspect that involves body movements that only affect certain parts of the body and are carried out by small muscles. Gross motor skills relate to body movements and postures performed by large muscles. Language skills refer to a child's ability to respond to sounds, follow commands, and speak politely. Social skills refer to children's behavior in adapting to the rules of society and the environment. The development of a toddler can be determined by carrying out developmental tests. There are several tools to test toddler development, such as the Developmental Pre-Screening Questionnaire (KPSP) [43].

Research results [32] show that there is a relationship between stunting and child development. More stunted children get development test results in the doubtful category than non-stunting children, which sequentially include the development of socialization and independence, speech and language, gross movement and fine movement.

Based on preliminary studies, there are 263 toddlers aged 24-60 months spread across seven Posyandu in Kertomulyo Village, Brangsong District, Kendal Regency. Information obtained through interviews with village midwives showed that from the seven Posyandu there were 48 stunted toddlers, of which 36 were aged 24-60 months. Apart from that, there appears to be developmental delays in children, but there has been no examination that covers all the questions in the KPSP. The results of observations carried out on 5 samples of toddlers showed that 2 out of 5 toddlers were stunted with questionable developmental results and 3 toddlers who were not stunted had appropriate developmental stages.

Methods

The type of research used is analytical observational research with a research design cross-sectional. The research was conducted in Kertomulyo Village, Brangsong District, Kendal Regency in May 2024 by following the schedule of each Posyandu. The population of this study was all toddlers aged 24-60 months in Kertomulyo Village, Brangsong District, Kendal Regency, totaling 263 toddlers using the technique proportional stratified random sampling. The sample size was 72 toddlers. Data analysis uses correlation tests Kendall Tau. Researchers obtained ethical approval no. 0521/EA/KEPK/2024.

Results and Discussion

Results

Table 1. 1

Frequency Distribution of Toddlers Based on TB/U Nutritional Status

No.	TB/U Nutritional Status	Frequency	Percentage (%)
1.	Stunting	23	31.9%
2.	Not stunting	49	68.1%
Amount		72	100%

Table 1.1 shows that 23 out of 72 toddlers experienced stunting with a percentage of 31.9%.

Table 1. 2

Frequency Distribution of Toddlers based on Development

No.	Development	Frequency	Percentage (%)
1.	In accordance	49	68.1%
2.	Doubtful	19	26.4%
3.	Deviation	4	5.6%
Amount		72	100%

Based on table 1.2, it can be seen that of the 72 toddlers, the majority, namely 49 toddlers (68.1%) showed development in the appropriate category.

Table 1. 3

Cross Tabulation of TB/U Nutritional Status with Development

Variable		Development			Total	p-value
		In accordance	Doubtful	Deviation		
TB/U Nutritional Status	Stunting	1 (4.3%)	18 (78.3%)	4 (17.4%)	23 (100%)	0.000
	Not stunting	48 (98%)	1 (2%)	0 (0%)	49 (100%)	
	Amount	49 (68.1%)	19 (26.4%)	4 (5.6%)	72 (100%)	

Based on table 1.3, toddlers who are stunted show the most development in the doubtful category, namely 18 toddlers (78.3%), while toddlers who are not stunted show the most development in the appropriate category, namely 48 toddlers (98%). The results of the Kendall Tau test show that there is a very strong correlation (p value=0.000; $r=0.909$) between stunting and the development of toddlers aged 24-60 months in Kertomulyo Village, Brangsong District, Kendal Regency with the opposite direction of the relationship.

Discussion

TB/U Nutritional Status

The research results in table 1.1 show that 23 toddlers (31.9%) experienced stunting. Stunting is a condition where children experience malnutrition because their food intake is not sufficient for their needs. The impact of stunting is that the child's height does not match his age [26].

Stunting is a problem of malnutrition in toddlers that is a concern throughout the world, especially in developing countries like Indonesia. The impacts that arise from stunting include reduced intelligence, slow growth, stunted development, reduced immunity, and low productivity. Long-term effects occur on cognitive development, learning ability, and productivity in adulthood [22].

Stunting that has occurred if it is not balanced with catch up growth (catch-up growth) causes a decrease in development. Stunting is a public health problem associated with an increased risk of morbidity, death, and impaired motor and mental growth. Stunting is indicated by growth faltering and catch up growth inadequate which causes the inability to achieve optimal growth. This shows that toddlers born with normal weight can experience stunting if their subsequent needs are not met properly [10].

The causes of stunting in children can be divided into two, namely direct factors and indirect factors. The level of nutritional consumption, hereditary factors, and infectious diseases suffered by children are direct causes of stunting. The nutrients the body needs consist of macronutrients and micronutrients. Deficiencies in macronutrients, namely protein and micronutrients, namely Fe, Zn, Ca, vitamins D, A and C, can cause stunting. Hormones are also related to stunting. One of the hormones that plays a role in the child's growth process is thyroid hormone. Hereditary factors are also related to stunting. Short parents can have short offspring. Maternal knowledge about nutrition, parenting patterns, parental income level, and use of health services are indirect causes of stunting. Low income is one aspect of poverty. Poverty factors are related to lack of access to food and adequate environmental sanitation, as well as lack of family coverage of basic health services [13].

Efforts to prevent stunting must start with mothers during pregnancy, especially during the first thousand days of life, and can be started by increasing mothers' knowledge and attitudes about how to prevent stunting. Strengthening interventions to increase mothers' awareness about health services and nutritional requirements, the importance of nutritional packages for pregnant women (additional food, vitamin A, blood supplement tablets), fulfilling the nutritional needs of pregnant women, daily protein consumption for toddlers aged over 6 months with protein levels appropriate to their age, understanding the care and development of children's growth and development, maintaining sanitation and meeting clean water needs, and bringing toddlers to Posyandu regularly once a month. The toddler's height will be measured so that it can be ascertained whether the toddler is stunted or not [4].

Development

Based on the research results in table 1.2, it was found that 49 toddlers (68.1%) were included in the development category according to the number of 'Yes' answers on the KPSP of 9-10, 19 toddlers (26.4%) had their development included in the doubtful category with a number of 'Yes' answers of 7-8, and 4 toddlers (5.6%) were included in the deviation category with a 'Yes' answer of 6 or less.

Based on age category, failure in the development of 24 month old toddlers was found in the gross movement aspect of 9 toddlers (42.9%). 30 month old toddlers experienced failure in aspects of speech and language as many as 5 toddlers (41.7%). Toddlers aged 36 months failed in aspects of socialization and independence as many as 4 toddlers (50%). 42 month old toddlers failed in aspects of fine movement and independent socialization as many as 4 toddlers (44.4%). 48 months old toddlers failed in the speech and language aspect as many as 4 toddlers (36.4%). 54 month old toddlers experienced failure in aspects of socialization and independence as many as 4 toddlers (44.4%). 60 month old toddlers failed in aspects of fine movement and socialization and independence as much as 1 toddler (50%).

Of all age groups, developmental failures are most often found in aspects of socialization and independence. Children who are stunted have lower social-emotional scores than children who are not stunted. This is caused by anxiety, depressive symptoms, and low self-esteem, so that the child's psychosocial function becomes poor. Stunted children tend to have psychological problems such as self-satisfaction with their height and a tendency to be treated as if they are younger than their age, bullied, and bullied. In addition, adverse psychosocial impacts can continue into adolescence where height can affect self-efficacy and interactions with peers [17].

Second developmental failure in aspects of speech and language. Speech and language skills will continue to develop during toddlerhood. On average, at the age of 24 months, toddlers will know 500 vocabulary words and this increases to 900 to 1000 words at the age of 36 months. Speech and language

development occurs very quickly because toddlers' brain cells have a system mapping. Prolonged stunting inhibits growth axonal and Dendritic, formation synapse, process your mind, and greatly interfere with the acceleration of nerve impulses from one brain cell to another, resulting in the process mapping will run slowly [18].

The next developmental failure occurred in the aspect of fine movement. Failure to develop fine motor skills is caused by delayed maturation neuron on cerebellum, so the brain cannot actively stimulate fine motor skills. Reduced fine motor skills are associated with lower muscle mechanical performance tricep surae, so that stunted children cannot carry out fine movements fully and spontaneously, one of which is the functioning of small muscles in finger movements. As toddlers' nutritional status improves, fine motor development also increases. For every 1% increase in fine motor development, toddlers' gross motor development increases by 0.46% [2].

The latest development failure is in the aspect of gross movement. Stunted toddlers tend to receive care where their movements are restricted because they look weak and tire easily, such as being carried or served. This condition results in stimulation of the growth of large muscles and their movement is not optimal. Toddlers who are stunted will passive, apathetic, and less interested in games that require gross motor skills, so children tend to be quiet. Lack of energy and protein intake also inhibits large muscle growth, so stunted toddlers have more limited energy for active play [36].

In accordance with the principle of development, all aspects of development mutually influence each other. Disturbances in one aspect of development in stunted children can result in disruption of development in other aspects. Various stimulations provided through the five senses during toddlerhood have a significant impact on brain growth and maturation [47].

The quality of a child's future development is determined during the toddler years. Where during the toddler years there is optimal development, then development in the following period tends to be good. Likewise, if symptoms of stunting can be identified, treatment can be given early. The aim is to create toddlers with good motor, speech and language functions, as well as socialization and independence skills, so that they can improve the child's quality of life in the future [28].

The Relationship between Stunting and Development

Based on table 4.3, of the 72 toddlers, 4 toddlers (17.4%) who experienced stunting had development in the deviation category, 18 toddlers (78.3%) had development in the doubtful category, and 1 toddler (4.3%) had appropriate development. 48 toddlers who were not stunted had development in the appropriate category (98%), but there were also 1 toddler (2%) who experienced development in the doubtful category.

Results of analysis using correlation test Kendall Tau shows that there is a very strong correlation (p value=0.000; $r=0.909$) between stunting and the development of toddlers aged 24-60 months in Kertomulyo Village, Brangsong District, Kendal Regency. The two variables have the opposite direction of relationship, indicated by negative results. This indicates that the higher the level of stunting in children under five, the more their level of development decreases (hinders) in various aspects, and vice versa. That means there is a relationship inverse between stunting and toddler development, so it can be concluded that stunting has a negative impact on toddler development.

Stunting is one of the causes of developmental disorders in children due to chronic malnutrition that occurs in the womb and in the first 1000 days of life (HPK). Nutrition plays an important role during the first 2 years of life. Brain cells require adequate nutrition for their growth and development. Adequate nutrition during the toddler years affects the child's growth and development process in the following period [39].

Stunting refers to children who suffer from malnutrition. Insufficient nutrition results in abnormal developmental disorders such as delayed nerve maturation, slow motor movements, decreased intelligence, and slow social responses. Children who receive adequate nutrition are able to interact better with their environment and have better developmental experiences [14].

This is in accordance with research [33] which shows that there is a relationship between the incidence of stunting and the development of children aged 24-59 months in Wangen Polanharjo Village, with the value p -value equal to 0.024 ($p<0.05$). Similar research conducted [16] shows a relationship between stunting nutritional status and child development. Nutritional status is one of the factors that determine a child's growth and development. Toddlers with a good nutritional status (TB/U) have a 3.3 times greater chance of achieving good development compared to toddlers with stunting.

Conclusion

The incidence of stunting among toddlers aged 24-60 months in Kertomulyo Village, Brangsong District, Kendal Regency was 23 toddlers (31.9%). The development of toddlers aged 24-60 months in Kertomulyo Village, Brangsong District, Kendal Regency, shows that the majority of toddlers, namely 49 toddlers (68.1%) are in the appropriate category. There is a relationship between stunting and the development of toddlers aged 24-60 months in Kertomulyo Village, Brangsong District, Kendal Regency, with p value $0,000 < 0,05$.

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