



STUNTING RELATIONSHIP WITH DEVELOPMENT OF CHILDREN AGE 12-36 MONTHS IN THE REGION OF THE SAMBONG BLORA

Sifak Refin Pangesti¹; Rizky Amelia²; Dhita Aulia³

^{1,2,3}Postgraduate Program Poltekkes Kemenkes Semarang, Indonesia

Corresponding author: Sifak Refine Pangesti

Email: sifakrefinpangesti@gmail.com

ABSTRACT

The Province of Central Java is one of the provinces with a 32% high stunting rate. The Blora Regency itself is included in the top 10 highest stunting priority districts category. The government implemented some efforts to control that have been done, such as prevention like Raskin and PMT, scouting the toddlers' growth in the clinic, and giving zinc syrup to the stunting baby. This research aims to determine the relationship between stunting and the development of children age 12-36 months. Toddlers with stunting tend to be a stunning development. The method of this research is an observation with a cross section design. For the sampling, using the Slovin formula with the cluster sampling with a total 56 respondents. The instrument that was used is KPSP according to the aged of the toddlers. The analysis that was used is Kendall's Tau. The result shows a relationship between stunting and the 12-36 months old toddlers, with the statistic results using Kendall's Tau were obtained the value of $p = 0,003$ or $<0,005$. The toddlers' mother is expected to fulfill the nutrition of their toddlers and check-up routine to the health facilities for checking the growth and development of the toddlers so that they can be scouted as well.

Keyword: Stunting, toddler development

Introduction

Growth and development are continuous processes that depend on the biological potentials involved in the interaction between genetic factors and the bio-physical-psychosocial environment. Development is related to the ability to function and structure the body, increasing and more complex and more progressive, directed, and integrated. Several aspects within the development scope, including cognitive development, language, motor skills, and behavior or interactions with the environment¹.

Nutritional intake in toddlers is essential in supporting growth by the growth

chart so that growth faltering does not occur, which can cause stunting. Stunting is a condition of failure to thrive in children under two years due to chronic malnutrition. Stunting is a major problem because it is associated with an increased risk of illness and death, less than optimal brain development, so motor development and mental or brain development is hampered in the short term and affects cognitive abilities².

The state of stunting has a devastating effect on all domains of development and changes in brain development. Toddlers who suffer from stunting generally have clinical symptoms, including stunted growth;

children with muscle cerebral palsy will experience motor problems, hearing loss, language and speech disorders³.

The highest proportion of stunting came from South Asia (58.7%) and the lowest in Central Asia (0.9%). The global situation of stunting in Indonesia is 32%⁴. In Indonesia, the province with the highest prevalence of concise and stunted children aged 0-59 months in 2018 is Aceh, while the province with the lowest prevalence is DKI Jakarta. Central Java Province is in 8th place out of 18 provinces with a high prevalence (30% - <40%) with a 32% stunting incidence rate⁵. Blora Regency is included in the top 10 highest stunting priority districts. The percentage of the incidence of stunting in Blora Regency was 8.3%. According to the Blora District Health Office in February 2019, there are areas in Blora Regency for children with stunting aged 0-59 months, including Sambong (9.3%), Jiken (4.2%), Bogorejo (7.4%), Japan (3, 4%), Medang (7.9%). Based on these data, the Sambong area is in the high stunting category. Based on data from the Sambong Health Center in August 2019, there were 147 toddlers aged 6-59 months suffering from stunting.

Stunting priority programs include accelerating poverty reduction, improving public health and nutrition services, equal distribution of quality education services, increasing access to adequate housing and housing, and improving basic service governance⁵. Other efforts by the government to establish 5 main pillars for handling stunting, namely: pillar 1, commitment and vision of state leaders, pillar 2 of the national campaign focuses on understanding, behavior change, political commitment and accountability, pillar 3 convergence, coordination, and consolidation of national, regional and community programs, pillar 4 encourage the policy of "nutritional food security," pillar 5 is monitoring and evaluation⁶.

Based on the condition of stunting that has occurred, efforts to deal with stunting, government programs that have been implemented in the field related to food security related to the nutritional status of children under five include: making laws, food aid in the form of poor rice (Raskin) and blog, Provision of Supplementary Food (PMT) especially for underweight toddlers in the form of local PMT and manufactured PMT, namely toddler MT biscuits. If the bodyweight is by calculating body weight according to height, the MT for underweight children can be stopped and continued with a balanced nutritional family diet, food assistance from other sources, monitoring the growth of children at the posyandu, giving zinc syrup to stunting babies. Prevention of stunting can be done with a national movement to accelerate nutrition improvement to increase human resources that are healthy, smart, and productive⁵.

Several nutrition improvement movements focusing on the first 1000 days of life at the global level are called Scaling Up Nutrition (SUN) and in Indonesia it is called Gerakan Nasional Percepatan Perbaikan Gizi Dalam Rangka 1000 Hari Pertama Kehidupan (Gerakan 1000 HPK 7.

Some research is done, motor development in children aged under 2 years shows a stunting relationship, which is influenced by chronic malnutrition status in children under five⁸. Children who suffer from stunting have a 6 times greater risk of experiencing gross motor development disorders than children who are not stunted⁹. The impact of stunting on children's health and development is very detrimental. Stunting can cause developmental problems in children, especially in children under two years of age. Generally, stunted children will experience obstacles in their cognitive and motor development, affecting their productivity as adults. Stunted children also have a greater risk of suffering from non-

communicable diseases such as diabetes, obesity, and heart disease as adults⁴.

Based on the research results, 10 children with short nutritional status have delayed motor development, while children with normal nutritional status have motoric development not late. The study results by 8 state that stunted children have an 11.98 times greater chance of having motor development below the average with control over gender. The results of the research¹¹ stated that there were differences between the gross motoric development, personal-social, language, and fine motor skills of stunting and non-stunting children, 72.2% of the sample of stunting children had a suspicious developmental status.

The age of 2 years is the golden period for optimal brain growth and development. The child's brain tissue will grow normally, reaching 80% of an adult's brain's weight before the age of 3 years. Children with impaired or delayed gross motor development are more common than stunted children. Children who are stunted are 6 times more likely to have gross motor problems than children who are not stunted. Early detection of children's developmental disorders under five can be done through history taking, routine examinations, development screening, and further examinations¹⁰.

This study aims to know the relationship between the incidence of stunting and gross motor development of children aged 12-36 months in Blora Regency.

Methods

This type of research is a correlation research study that aims to determine the relationship between two variables in a situation or group of subjects. The research design in this study is observational with a cross-sectional approach.

The independent variable is stunting, and the dependent variable is the development of children under five. This study's population was stunting toddlers aged 12 - 36 months who were in the Sambong Community Health Center, Sambong District. Sampling using cluster sampling technique as many as 56 toddlers. The research was conducted in June 2020 in the Sambong Health Center's working area, Blora Regency. Measuring instruments in this study are height measurement tools (length board and microtoice), KPSP sheet, and observation sheet.

Researchers submitted ethical clearance or ethical eligibility to the Ethics Commission for Health Research in Nursing at Sultan Agung Islamic University with number 194 /A.1-S1/FIK-SA/V/2020.

Results and Discussion

1. Univariate Analysis

a. Frequency of Stunting

Frequency Distribution of 12-36 Months Stunting.

Table 1 Frequency Distribution of 12-36 Months Stunting.

Stunting classification	Frequen cy	Percentage (%)
Very short	14	25 %
Short	42	75 %
Total	56	100%

Based on table 1, stunting toddlers with short categories, namely Z-score <-3SD as many as 42 toddlers (75%), while toddlers with concise categories, namely Z-score <-3SD values as many as 14 toddlers (25%).

b. Development of Stunting Toddlers Ages 12-36 Months

Table 2 Development of Toddler Stunting

Toddler development	Frequency	Percentage (%)
Deviate	6	10,7
Doubt	33	60,7

Corresponding	17	28,6
Total	56	100%

Based on table 2, stunting toddlers' development is mostly in the dubious category, namely as many as 33 toddlers (60.7%), while for children under five with a small deviation category, it is only 6 (10.7%). , 6%).

2. Analysis Bivariate

Table 3 The relationship between stunting and development of children aged 12-36 months.

Stunting	Toddler development								P-Value
	Deviate		Doubt		Corresponding		Total		
	f	%	f	%	f	%	f	%	
Very Short	4	9,7	10	23,4	0	0	14	25,4	0,003
Short	2	1	23	37,3	17	28,6	42	74,6	
Total	6	10,7	33	60,7	17	28,6	56	100	

Based on table 3 with the KPSP measurement tool, it can be seen that 6 toddlers whose development is deviant / experiencing deviations are mostly experienced by stunting children with a concise classification of 4 (9.7%), on the other hand, 33 toddlers with development of doubtful value are mostly experienced by stunting children. With a short classification of 23 (37.3%) and 17 children under five whose development was normal, all of them experienced stunting with a short classification of 17 (28.6%).

Discussion

1. Stunting Incident

Based on the study results, it was found that from 56 respondents under five, there were 42 (75%) toddlers with short status and 14 (25%) toddlers with concise status. Of the 56 samples, there were 4 toddlers aged 12-18 months, ages 19-24 months, 12 toddlers, 25-30 months, 16 toddlers, 31-36 months and 24 stunting toddlers. Based on Hermansyah and Mentari (2018) research, causes related to stunting status include a history of

Total 56 stunted toddlers short and concise classifications appropriate development were only 28,6%, dubious development are 60,7%, and development deviates are 10,7%

infectious diseases during infancy, diet, and birth length. For the level of education and work of parents, it is not the main cause of child nutrition problems, but rather a factor that affects the provision of food and child care.

According to Ramayulis (2018), factors that influence stunting in children under five are limited health services, including ANC services, lack of access to clean water and sanitation, and poor parenting practices. Limited access to ANC services can reflect the demographic conditions of an area where access to health services is easily accessible or vice versa. There is no adequate access to health services. Difficult access to health for pregnant women makes it difficult to detect stunting causes, such as pregnant women with anemia, pregnant women with chronic energy deficiency (KEK), and adequate consumption of blood supplemented tablets. Access to clean water and sanitation also affects the factor of stunting, where if access to clean water and sanitation is poor, it will be prone to infection. Toddlers with poor parenting practices, in this case,

parents with low knowledge or parents with low education, greatly influence the provision of nutrition to children, especially knowledge about nutrition that must be fulfilled by the age of children under five.

According to Ramayulis (2018), stunting prevention programs can be carried out in the first 1000 days, including nutrition for pregnant women, nutrition for breastfeeding mothers and children 7-23 months, and exclusive breastfeeding. On the other hand, according to TNP2PK (2017), macro interventions that can be done are providing and ensuring access to clean water, providing and ensuring access to sanitation, fortifying foodstuffs, and providing access to health services and family planning (KB). With efforts to prevent stunting, broadly speaking, will reduce the level of poverty because stunting can reduce children's creativity in the future to hinder economic growth and increase poverty.

2. Development of Stunting Toddlers Ages 12-36 Months

Based on the results of the study, it was found that most of the children under five were categorized as dubious development, namely a score of 7-8 YES answers from the 10 questions on the KPSP sheet (60.7%), while stunting toddlers with deviant development categories were a score of 6 or <6 answers. YES out of the 10 questions on the KPSP sheet (10.7%), and stunting toddlers with normal development categories, namely a score of 9-10 YES answers from 10 questions on the KPSP sheet (28.6%).

With doubtful development, toddlers were 33 children, including 9 children aged 12-24 months, 24 children aged 25-36 months. There were 6 children with deviant development, including 3 children aged 12-24 months, 3 children aged 25-36 months. Meanwhile, 17 children with appropriate development included 4 children aged 12-24 months, 13 children aged 25-36 months.

Toddlers aged 12-24 months with dubious development 2 children failed in gross motoric aspects, 2 failed in language

aspects, 4 children failed on fine motor aspects, and 1 child failed on personal social aspects. In the developmental aspect of deviation, 1 child failed in the gross motoric aspect, and 2 children failed in the speech and language aspects. Whereas in the appropriate development, 2 children were failing in gross motor aspects and 2 children failing in fine motor aspects.

In toddlers aged 25-36 months with dubious development, 17 children failed in gross motoric aspects, 5 failed in language aspects, and 2 failed in social aspects of independence. In the developmental aspect of deviation, 2 children were failing in gross motor aspects, and 1 child was failing in aspects of speech and language. Whereas inappropriate development, 7 children were failing in gross motoric aspects and 2 children failing in fine motor aspects, 4 children failing in aspects of socialization of independence.

This study's results are in line with research (Amaliah et al., 2016), which states that stunting is a failure to achieve optimal growth, which affects not only children's physical growth but also cognitive development and other intelligence. Children who are stunted can cause child's curiosity about the environment to be lost. Less optimal development of intelligence will disrupt children's emotional intelligence, and loss of children's curiosity about the environment will hinder the process of children's social development.

The development consists of four aspects, namely gross or gross motoric movements, fine or fine motoric movements, speech and language skills, and socialization and independence. These four aspects can be measured using the KPSP (Developmental Pre-Screening Questionnaire), categorized as appropriate, doubtful, and deviation. The results of other research Wijadasa (2016) applied the KPSP screening method, namely research conducted in Sri Lanka where this study was conducted to test the application of developmental screening tests universally

and regionally. This screening method was adapted and standardized on a sample of 4251 Sri Lankan children aged 0–80 months.

Based on Rahmadi's research (2017), 70 children with short status, 48% of the SDQ (Strengths and Difficulties Questionnaire) results have an abnormal total score. Children with short status often have problems with peers, so they prefer to be alone than children of their age, rarely have close friends, complain of being bullied by their friends, and tend to be more comfortable playing with adults. Children with short status have less self-esteem and result in difficulty making friends, and are not easy to accept among their peers. Things like this encourage children to act aggressively or behave the opposite, avoided by peers, the more withdrawn and the child tends to be closed.

Stunted children are children who have malnutrition. The inadequate nutritional status will cause abnormal developmental disorders, characterized by slow maturity of nerve cells, lack of intelligence and slow social response, and slow motor movement. Well-nourished children will have a better ability to interact with the environment to have a better experience for development (Ernawati, 2012).

Stunting occurs due to chronic malnutrition. Research conducted by Sutiari (2018) states a relationship between nutritional status at birth and child development. Malnutrition during Badura can result in a 15-20% reduction in brain cells so that later on, they will become humans with a brain quality of around 80-85% and impaired mental development. Other studies suggest that stunted children have a worse psychological function (more anxiety and depression) than non-stunted children.

The Relationship between Stunting and Development in Toddlers Age 24-59 Months

The results of cross-tabulation of stunting with development in toddlers aged

12-36 months in the working area of the Sambong Community Health Center, Blora Regency in 2020, it can be seen that of the 6 toddlers whose development is deviation value, most of them are stunting with the concise classification of 4 (9.7%), On the contrary, from 33 toddlers with doubtful development, most of them were stunting with short classification 23 (37.3%), as well as 17 children under five whose development was normal, all of them were stunting with short calcifications 17 (28.6%).

Other research on stunting and development can be seen in Woldehanna's (2017) study, which shows that early childhood stunting is significantly negatively related to children's cognitive performance. The stunted children scored 16.1% lower on the Peabody Image Vocabulary Test and 48.8% lower on the Quantitative Assessment test when the child was eight years old, both statistically significant at $P < 0.01$.

Based on the results of the study, it states that stunting conditions can affect the development of toddlers, is by the theory of Ramayulis (2018), which states that stunted toddlers will have a level of intelligence that is not optimal, become more susceptible to disease, and in the future can be at risk of decreased productivity. In the end, in broad terms, stunting will inhibit economic growth and increase poverty.

According to Soetjningsih (2016), factors that can affect development include factors (differences in race or ethnicity or nation, family, age, gender, genetic disorders, chromosomal disorders), childbirth factors, and postnatal factors (nutrition, chronic disease, socio-economic, stimulation, parenting environment, and medicine).

Another study that describes the risk factors for development in children under five is Amir's (2019) study entitled Factors Associated with Development in Children Under Five, which shows that the development of children under five is

positively influenced by maternal age at pregnancy and the absence of birth asphyxia, birth weight. And family income and posyandu have a strong contextual effect on child development. In contrast, children's development is negatively affected by prolonged labor.

Other determinants of development are conveyed in Blair's (2015) research, showing that factors of development can be influenced at the family level, such as support, nurture, and stimulation, which can affect language development, social and emotional health. Meanwhile, the family factor itself is influenced by resources, which are determined largely by work and financial security. The environment and society can also influence, here factors such as safety, social cohesion, and marginalized low-income families are the main influences on early childhood development. Income distribution, employment, and migration patterns, and societal attitudes towards children influence the conditions in which children live, study, and grow up.

In the community itself, the condition of stunting is still not widely known. On the other hand, the length of the child's body, especially in children with stunted conditions, can affect brain development in children, this is according to the theory by Briend (2015) where stunting is a condition of chronic malnutrition so that the body that is lack of muscle mass will metabolize fat, in this case, there are fatty acids that cannot cross the blood-brain barrier, namely fatty acids with long chains or more than 12 carbon atoms. For stunted toddlers with disrupted development, there is a need for countermeasures to overcome it, as Soetjningsih (2016) stated that there are medical rehabilitation programs, including physiotherapy, occupational therapy, speech therapy, orthopedic therapy, psychology, and social workers.

Conclusion

The number of children under five with stunting was 56, with a concise status

as many as 14 and 42 under five with a stunting status. . This number consists of the very short and short stunting classifications. The result of doubtful development was mostly experienced by stunting with short classification.

There is a relationship between stunting and toddlers' development aged 12-36 months in the Sambong Health Center working area, with a p-value (0.003) or <0.05.

References

1. Soetjningsih. IG, N, Gede Ranuh. 2013. *Tumbuh Kembang Anak. Edisi 2*. Jakarta: EGC.
2. Yosephin Betty dkk. 2019. *Buku Pegangan Petugas KUA: Sebagai Konselor 1000 HPK dalam Mengedukasi Calon Pengantin Menuju Bengkulu Bebas Stunting*. Yogyakarta: Deepublish.
3. Miller, Ann C., et al. 2016. *How consistent are associations between stunting and child development? Evidence from a meta-analysis of associations between stunting and multidimensional child development in fifteen low-and middle-income countries*. Public health nutrition.
4. Pusat Data dan Informasi Kementerian Kesehatan RI. 2018. *Infodatin Stunting Indonesia*. Jakarta: Pusdatin, editor.
5. Riskesdas. 2018. *Badan Penelitian Pengembangan Kesehatan Kementerian Kesehatan RI 2018. Riset Kesehatan Daerah*. Jakarta: Riskesdas.
6. TNP2K.2017.100 *Kabupaten/Kota Prioritas Untuk Intervensi Anak Kerdil (Stunting). Edisi 1*. Jakarta: Sekretariat Wakil Presiden Republik Indonesia.
7. Ruaida, Nilfar. *Gerakan 1000 hari Pertama Kehidupan Mencegah Terjadinya Stunting (Gizi Pendek) di Indonesia*. Global Health Science (GHS).
8. Pantaleon, Maria Goreti, Hamam Hadi, dan Indria Laksmi Gamayanti. 2016. *Stunting Berhubungan dengan Perkembangan Motorik Anak di*

- Kecamatan Sedayu, Bantul, Yogyakarta. *Jurnal Gizi dan Dietetik Indonesia (Indonesian Journal of Nutrition and Dietetics)*.
9. Hudaini, dkk. 2011. *Hubungan Stunting dan Stimulasi dengan Perkembangan Motorik Kasar pada Anak Taman Kanak-Kanak Usia 3-5 Tahun di Banda Aceh: Jurnal Poltekkes Aceh*.
 10. Suwandi dan Ayu Rafiony. 2018. *Hubungan Status Gizi (TB/U) Terhadap Perkembangan Motorik Kasar pada Anak Usia 1-3 Tahun di Wilayah Kerja Puskesmas Korpri Kabupaten Kubu Raya. Pontianak Nutrition Journal (PNJ)*.
 11. Hanani, Ruth, dan Ahmad Syauqy. 2016. *Perbedaan Perkembangan motorik Kasar, Motorik Halus, Bahasa dan Personal Sosial pada Anak Stunting dan Non Stunting*. Diss. Universitas Diponegoro.
 12. Hidayat. 2012. *Pengantar Ilmu Keperawatan Anak 1*. Jakarta: Salemba Medika. *Urban Areas*). *Ejurnal Pustaka Kesehatan*.
 13. Ramayulis, R., Kresnawan, T., Iwaningsih, dan S., Rochani, N.S. 2018. *Stop Stunting dengan Konseling Gizi*. Jakarta: Penebar Swadaya Grup.
 14. Aridiyah, F., Rohmawati., Ririanty, M., 2015. *Faktor-Faktor yang Mempengaruhi Kejadian Stunting pada Anak Balita di*
 15. *Wilayah Pedesaan dan Perkotaan (The Factors Affecting Stunting On Toddlers In Rural*.
 16. Wahdah S, dkk. 2015. *Faktor Risiko Kejadian Stunting pada Anak Umur 6-36 Bulan di Wilayah Pedalaman Kecamatan Silat Hulu, Kapuas Hulu, Kalimantan Barat. Jurnal Gizi dan Dietetik Indonesia*.
 17. Rahmawati, Hanik, dan Susi Dyah Puspowati. 2018. *Hubungan Tingkat Konsumsi Energi dan Protein Anak Balita dan Perilaku Keluarga Sadar Gizi (KADARZI) dengan Kejadian Stunting di Desa Nyemoh Kecamatan Bringin Kabupaten Semarang. Universitas Muhammadiyah Surakarta*.
 18. Fikawati, S., A. Syafiq, dan A. Veratamala. 2017. *Gizi Anak dan Remaja. Edisi 1*. Depok: PT Raja Grafindo Persada.
 19. Supariasa, I. D. N., B. Bakri, dan F. Ibnu. 2013. *Penilaian Status Gizi Edisi Terbaru*. Jakarta: EGC.
 20. Waroh, Y. K. 2019. *Pemberian Makanan Tambahan Sebagai Upaya Penanganan Stunting pada Balita di Indonesia*. Jakarta: Media grup.
 21. Hestuningtyas, T.R. 2013. *Pengaruh Konseling Gizi Terhadap Pengetahuan, Sikap, Praktik Ibu dalam Pemberian Makan Anak, dan Asupan Zat Gizi Anak Stunting Usia 1-2 Tahun di Kecamatan Semarang Timur*.
 22. Arsenault Je, Daniel Lr, Mary Ep, Marta Dv, Kenneth Hb. 2008. *Additional Zinc Delivered In a Liquid Supplement, But Not In a Fortified Porridge, Increased Fat-Free Mass Accrual Among Young Peruvian Children With Mild To Moderate Stunting*. *Journal Of Nutrition*.
 23. Masturoh I, dan Anggita Nauri. 2018. *Bahan Ajar Rekam Medis dan Informasi Kesehatan (RMIK) Metodologi Penelitian Kesehatan*. Jakarta: Pusat Pendidikan Sumber Daya Manusia Kesehatan