

Volume: 13
Issue: 01
Years: 2023

Research Article

Relationship Between Stunting Incidents and Speech Delay in Toddlers at Posyandu X Cimahi

Dewi Umu Kulsum^{1*}, Sania Shalsabila², Dwi Hastuti³

¹Faculty of Health Science and Technology, Jenderal Achmad Yani University

*Email Corespondent: dewi.umukulsum@lecture.unjani.ac.id



Editor: KS
Received: 27/02/2023
Accepted: 05/04/2023
Published: 12/04/2023
Available Article:
10.33221/jiiki.v13i01.2380

Copyright: ©2023 This article has open access and is distributable under the terms of the Creative Commons Attribution License, which permits un-restricted use, distribution and reproduction in any medium, provided the name of the author and the original source are included. This work is licensed under a **Creative Commons Attribution-Share Alike 4.0 International License**

Conflict of interest statement: In this study, there is no conflict of interest.

Funding: The financial sources in this study are self-funding.

Abstract

Background: Stunting is a condition in toddlers with shorter growth compared to children their age. Inadequate nutritional intake in stunted children can inhibit brain growth, affecting child growth and development.

Objectives: This study aims to determine the relationship between the incidence of stunting and speech delay in toddlers at Posyandu X Cimahi

Methods: This study was designed using observational analytics with a cross-sectional study design approach. Sampling was carried out using a stratified random sampling technique of 47 respondents. The instrument used for stunting screening is a microtome/infantometer, and a Denver II is used for speech delay. Data analysis was performed univariately and bivariate with the Spearman correlation test.

Results: This study's results illustrate a relationship between the incidence of stunting and speech delay in toddlers at Posyandu X Cimahi.

Conclusion: Statistical results show a value of 0.021 ($p < 0.05$) with a correlation coefficient of 0.336 which means moderate correlation strength.

Keywords: denver II, stunting, speech delay, toddler

Introduction

Toddlers are included in the age group that is very vulnerable to various diseases and is the age group that has the most nutritional problems, one of which is stunting.¹ A critical period in the process of child growth and development occurs in toddlerhood because the essential growth and development that takes place at this age will affect the growth and development of children at a later age.² Stunting is a condition in toddlers with shorter height when compared

to the age of the child who has a z-score (threshold) value less than -2 Standard Deviation (SD) for stunted toddlers and less than -3 SD for toddlers very short (severely stunted).³ World Health Organization (WHO) data shows that 22% or 149.2 million children under five will be stunted in 2020. The United Nations Children's Emergency Fund (UNICEF) reports that Indonesia is ranked fifth highest in the world for stunting, with a prevalence of 24.4% occurring in toddlers aged 0-59 months.^{4,5} The Cimahi City Health Office reported an increase in the incidence of stunting for three consecutive years, namely 9.06% in 2019 and 10.80% in 2020, and experienced another increase in 2021 to 11.05%. The recap results of data on implementing the Toddler Weighing Month (BPB) for all puskesmas at the Cimahi City Health Office in 2021 found 11.05% or 3,551 cases of stunting in toddlers. Stunting cases with the highest prevalence were in Citeureup, with 23.77% or 550 stunting cases.⁶

Malnutrition from pregnancy to early childhood can have a severe impact, namely the disruption of brain development in children, which will later affect the process of child growth and development.⁷ One of the effects of stunting in the short term is the disruption of gross and fine motor development, speech and language skills, socialization, and child independence.³ Research conducted on stunted children and non-stunted children in 2016 showed that there were differences in the development between children who were stunted and children who were not stunted, namely 75% of children had language development disorders, and this is the second most common development in children.⁸ In 2011 another study conducted in Peru on preschool children showed that children who were taller than their age group had a larger vocabulary when compared to shorter children. Meanwhile, children with a history of stunting during their early childhood will have a limited vocabulary, so they are at risk of having a low level of intelligence when they enter school age.⁹

One of the language development disorders that can occur in children is speech delay, namely the tendency for children to find it difficult to express their feelings to others through words, such as speaking unclearly and not mastering vocabulary, which makes children experience obstacles in social interaction so that development Disturbed language can affect other aspects of development, namely the personal – social development of children.¹⁰ The role of the nurse in this problem is to take preventive or preventive measures, one of which is early detection which aims to screen the growth and development of children under five from an early age so that action can be taken immediately if there are developmental abnormalities in children. Researchers view that the problem of stunting in toddlers is significant to overcome because it can impact children's growth and development; one of the long-term impacts is the capacity and learning performance that is less than optimal during the school period. Another impact that is one of the factors causing developmental disorders is impaired communication and language development, such as speech delay or speech delay, dyslexia at Posyandu X Cimahi.

Methods

This study was designed using observational analytics with a cross-sectional study design approach. The population in this study were all stunted toddlers, with a total of 88 toddlers consisting of three posyandu.¹¹ Sampling was carried out using a stratified random sampling technique of 47 respondents. The inclusion criteria in this study were toddlers diagnosed with stunting and toddlers aged 12-59 months, while the exclusion criteria in this study were stunted toddlers who were sick: outpatient or inpatient.¹¹

The independent variable in this study is the incidence of stunting, and the dependent variable is speech delay. The instrument used for stunting screening is a microtome/infantometer, measuring the length/height of the toddler and then comparing it to the z-score for assessing speech delay using Denver II, which is adjusted for the age of the

Relationship Between Stunting Incidents and Speech Delay in Toddlers at Posyandu X Cimahi

toddler.¹² The stages in this research include the administrative stage of licensing the research location 070/3206/Dinkes from the Health Office and have received approval to obtain ethical approval on July 6, 2022 with letter number 09/KEPK/FITKES-UNJANI/VIII/2022. The use of the Denver II instrument has been tested Content Validity Index (CVI) by expert judgment. The data collection stage is carried out by determining samples by stratified random sampling, applying research ethics to informed consent to parents/guardians of respondents then measuring stunting, assessing the development of toddlers, and ending with the process of analyzing data. Data analysis was performed univariately and bivariate using the Spearman correlation test.

Results

Table 1. Frequency Distribution of Stunting Events Toddlers aged 12-59 Months at Posyandu X Cimahi

Stunting events	Frequency	Percentage
Very short	11	23.4%
Short	36	76.6%
Total	47	100%

Of the 47 respondents, most of the respondents experienced stunting with a short category, namely those with a Z-Score score of -3 SD to <-2 SD as many as 36 (76.6%) respondents.

Table 2. Speech Delay Frequency Distribution at Toddlers Age 12-59 Months at Posyandu X Cimahi

Speech Delays	Frequency	Percentage
Untestable	11	23.4%
Suspect	36	76.6%
Normal		
Total	47	100%

Of the 47 respondents who experienced stunting, more than half were classified as suspects/ suspected of experiencing delays as many as 33 (70.2%) respondents.

Table 3. Relationship between stunting and speech delay in toddlers aged 12-59 Months at Posyandu X Cimahi

Stunting events	Speech Delays						Total	P-Value	CC	
	Untestable		Suspect		Normal					
	N	%	N	%	N	%				
Very short	1	9,1	10	90,9	0	0,0	11	100	0.021	0.336
Short	1	2,8	23	63,9	12	33,3	36	100		
Total	2	4,3	33	70,2	12	25,5	47	100		

The category of suspect/suspected development experienced delays, namely 23 respondents (63.9%). Of the 11 respondents with a very short stunting category, most of the respondents were classified as suspect/suspected developmental categories delays 10 respondents (90.9%), and of the 36 respondents with short stunting categories, more than half were classified as Of the 12 respondents with normal development values, 12 were experienced

by stunting toddlers in the short category (33.3%). Statistical results using the Spearman Correlation test obtained a p-value of 0.021 ($p < 0.05$) and a correlation coefficient value of 0.336, so it can be implied that H_0 was rejected meaning that there is a relationship between stunting incidence and speech delay in toddlers aged 12-59 months with values that show moderate correlation strength.

Discussion

Statistical results using the Spearman correlation test obtained a p-value of 0.021 ($p < 0.05$) and a correlation coefficient value of 0.336, so we can conclude that H_0 is rejected. It means there is a connection between incident stunting and speech delay in toddlers ages 12-59 months, showing a value strength correlation medium. This is in line with the results of research that shows that a child stunted is twice more risk of experiencing lateness in hearing, skill talk, and skills Language compared to with child who has nutrition good (OR 2.36, 95% CI 0.95-5.91).¹³ The ability to speak a child depends on the organs' maturity.¹⁴ Organ maturity is strongly influenced by health, pattern of eating, and the environment child. This is related to the development blocked brain. Lack of substance nutrition period length in stunting children inhibits the growth of axons and dendrites, formation affecting synapses and myelination transfer speed between nerves.¹⁵ Research results show that more than half of respondents manifold sex men. Research in India shows that checking in children's men is 38% tall compared to daughters.¹⁶ Daughter's superiority in development Language early, almost all disturbance development mainly affecting communication, speech, and skills Language more Lots experienced by children man. Kindly anatomy child-man has more volume and weight and brain significance compared to child Woman, which is around 12-20%. Besides that, sons of women and men also use the part of different brains for memorizing, expressing emotion, knowing face someone, breaking down problems, and deep making decisions. In general, child Woman Study Language faster compared to superior children's men in visuals and movement.^{17,18}

Based on the results study, there are as many as 41 (87.2%) toddlers aged 24-59 months who experienced stunting and as many as 28 (68.3%) toddlers aged 24-59 months who experienced speech delay. This is possibly caused because at age the toddler already enters age preschool, which is precisely at the period of 36-48 months, but a part of the big toddlers in the study this not follow preschool education. Ability speech and language in toddlers will significantly increase at 36 - 48 months; Vocabulary increases from 50-100 to 200 and 2100 in year fifth (60 months). Arrangement sentences increase " telegraphy " to two and three words to be all Language trees.¹⁹ The child who doesn't attend preschool Possibly experiences speech delay because of lack of stimulation given to children. Group play is educating child age early non-formal to help the growth and development child, so that later Ready enter education more continue. Stimulation is given in a manner thorough and appropriate to stages of development. Besides, it's also learning done through play, which is done gradually, so that child learning gets characteristic habituation, No typical coercion.²⁰ The reason main happening stunting are intake and no adequate nutrition. Giving food to children needs a parental role, especially the mother. Most respondents in the study this not raised directly by their mothers but were entrusted to the nanny because of their mother's work outside the house. Work mother is very relevant with pattern foster care received children and economic status family. Skills Language children start to thrive in families, schools, and communities. Family is the foremost factor in developing a child in all fields. If a family is slow in pushing the ability to language and talk son, then the development child will be hampered.²¹

A child with a speech delay will have difficulty disclosing her feelings through words which will hinder the child from interacting socially with Friends his peers. The development

of impaired language in children will influence aspects of development other, especially aspect personal and social development. This aligns with research conducted by Jimoh et al. (2018), which shows that children stunted five times more Possibly experience lateness in interactive social skills (OR 5.0, 95% CI 2.0–13.0).¹³ Other research conducted with the title "Disruption Late Talk (Speech Delay) And Its Effects on Early Childhood Social Skills" shows that disturbance late talk influence skills for social children's abilities to form a social connection. Because of trouble this, children have difficulty communicating with other people.²² Condition stunting in public alone still becomes things that haven't. Many are known, especially Again, about the possible impact on children, especially toddlers. Checking to Regulation of the Minister of Health No. 39 of 2016, one given intervention is to organize a simulation of early child development.²³ Toddlers experience stunting lateness in action because of stunting, especially children with speech delays necessary exist effort countermeasures for overcome one method for overcoming speech delay is therapy talk and give stimulation until the development son by stages her age.²⁴

This is in line with the results of research that shows that a child stunted is twice more risk of experiencing lateness in hearing, skill talk, and skills Language compared to with child who has nutrition good (OR 2.36, 95% CI 0.95-5.91).¹⁶ Girls and boys own development different physical and motor, child man more active than children girls, and child men tend to hold more body more considerable and are more activity heavy than child female. Therefore they need more energy and protein and are more at risk of experiencing a lack of nutrition. If need nutrition No fulfilled well.¹⁴ Daughter's superiority in development Language early, almost all disturbance development mainly affecting communication, speech, and skills Language more Lots experienced by children man. Based on the results study, there are as many as 41 (87.2%) toddlers aged 24-59 months who experienced stunting and as many as 28 (68.3%) toddlers aged 24-59 months who experienced speech delay. This is supported by research conducted on Stunted Children Aged 25-60 Months in the District Sukorejo City of Blitar which shows that one-factor reason for stunting is working mothers.²² Skills Language children thrive in families, schools, and communities. Family is the main factor in the developing child in all fields; if the family is slow in pushing the ability to language and talk son, the child will be hampered.¹³ Other research conducted under the Title " Disruption Late Talk (Speech Delay) And Its Effects To Early Childhood Social Skills " shows that disturbance late talk influences Skills in social children's abilities in form connection social.²³

Conclusion

The researchers concluded that the results presented by Microtome/infantometer measurements describe 36 respondents (76.6%) in the short stunting category, and using Denver II illustrates a fairly high result in the developmental value of suspects/suspected delays A total of 33 respondents (70.2%). The results of the correlation analysis between the incidence of stunting and speech delay in toddlers obtained a p-value of 0.021 ($p < 0.05$) with a correlation coefficient value of 0.336 which shows that the strength of the correlation is moderate, which illustrates that children with the very short stunting category have a high probability of suspect/suspected developmental delays as many as 10 respondents (90.9%). Despite significant analyses, researchers realized that there were limitations to the study, including a small population and sample sizes and a narrow coverage area. Other factors are needed to deepen inclusion in the analysis of factors causing speech delays such as parenting, and anatomical structural abnormalities of the speech area. Further research recommends expanding the group of toddlers to a wider target area so that the results can be used for accurate and appropriate intervention determination.

Conflict of Interest Declaration

In this study, there is no conflict of interest.

Acknowledge

None.

Funding

The financial sources in this study are self-funding.

References

1. Hartono. Status Gizi Balita dan Interaksinya [Internet]. Sehat Negeriku. 2017. p. 46–9. Available from: <https://sehatnegeriku.kemkes.go.id/baca/blog/20170216/0519737/status-gizi-balita-dan-interaksinya/>
2. Kementerian Kesehatan RI. Pedoman Pelaksanaan: Stimulasi, Deteksi, dan Intervensi Dini Tumbuh Kembang Anak di Tingkat Pelayanan Kesehatan Dasar. 2016. 53–82 p.
3. Kementerian Kesehatan RI. Mengenal Stunting dan Gizi Buruk. Penyebab, Gejala, dan Mencegah [Internet]. Direktorat Promosi Kesehatan dan Pemberdayaan Masyarakat. 2018. Available from: <https://promkes.kemkes.go.id/?p=8486>
4. World Health Organization. The UNICEF/WHO/WB Joint Child Malnutrition Estimates (JME) Group Released New Data for 2021 [Internet]. World Health Organization. 2021. Available from: <https://www.who.int/news/item/06-05-2021-the-unicef-who-wb-joint-child-malnutrition-estimates-group-released-new-data-for-2021>
5. Badan Penelitian dan Pengembangan Kesehatan RI. Studi Status Gizi Indonesia (SSGI) [Internet]. Balai Besar Penelitian dan Pengembangan Tanaman Obat dan Obat Tradisional. 2021. Available from: <http://www.b2p2foot.litbang.kemkes.go.id/index.php?page=postcont&postid=285&content=SSGI>
6. Dinas Kesehatan Kota Cimahi. Prevalensi Stunting [Internet]. 2021. Available from: <https://dinkes.cimahikota.go.id/>
7. World Health Organization. Malnutrition [Internet]. World Health Organization. 2016. Available from: https://www.who.int/health-topics/malnutrition#tab=tab_1
8. Hanani R, Syaury A. Perbedaan Perkembangan Motorik Kasar, Motorik Halus, Bahasa, dan Personal Sosial Pada Anak Stunting dan Non Stunting. *Journal of Nutrition College*. 2016;5(4):412–8. <https://doi.org/10.14710/jnc.v5i4.16452>
9. Crookston BT, Dearden KA, Alder SC, Porucznik CA, Stanford JB, Merrill RM, et al. Impact of Early and Concurrent Stunting on Cognition. *Maternal & child nutrition*. 2011 Oct;7(4):397–409. <https://doi.org/10.1111/j.1740-8709.2010.00255.x>
10. Miftakhurizqi O. Asuhan Keperawatan pada Anak Usia Prasekolah dengan Keterlambatan Bicara (Speech Delay) dengan Fokus Studi Hambatan Komunikasi Verbal di RA Bani Malik Ledug Purwokerto. Poltekkes Kemenkes Semarang; 2018.
11. Riyanto A. Aplikasi Metodologi Penelitian Kesehatan. 2nd ed. Yogyakarta: Nuha Medika; 2018.
12. Riyanto A. Pengolahan dan Analisis Data Kesehatan. 1st ed. Yogyakarta: Nuha Medika; 2017.
13. Jimoh AO, Anyiam JO, Yakubu AM. Relationship between child development and nutritional status of under-five Nigerian children Relationship between child development and nutritional status of under-five Nigerian children. *South African Journal of Clinical Nutrition*. 2018;0658:1–5. <https://doi.org/10.1080/16070658.2017.1387434>
14. Soetjiningsih, Ranuh IGNG. Tumbuh Kembang Anak. Jakarta: EGC; 2013.
15. Perkins JM, Kim R, Krishna A, McGovern M, Aguayo VM, Subramanian S V. Understanding the association between stunting and child development in low- and middle-income countries: Next steps for research and intervention. *Social Science & Medicine*. 2017 Nov 1;193:101–9. <https://doi.org/10.1016/j.socscimed.2017.09.039>

16. Aguayo VM, Nair R, Badgaiyan N, Krishna V. Determinants of Stunting and Poor Linear Growth in Children Under 2 Years of Age in India: An in-depth Analysis of Maharashtra's Comprehensive Nutrition Survey. *Maternal & child nutrition*. 2016 May 1;12 Suppl 1(Suppl 1):121–40. <https://doi.org/10.1111/mcn.12259>
17. Adani S, Cepanec M. Sex Differences in Early Communication Development: Behavioral and Neurobiological Indicators of More Vulnerable Communication System Development in Boys. *Croatian Medical Journal*. 2019;60(2):141. <https://doi.org/10.3325%2Fcmj.2019.60.141>
18. Azzahroh P, Sari RJ, Lubis R. Analisis Perkembangan Bahasa Pada Anak Usia Dini di Wilayah Puskesmas Kunciran Kota Tangerang Tahun 2020. *Journal for Quality in Women's Health*. 2021 Mar 1;4(1):46–55. <https://doi.org/10.30994/jqwh.v4i1.104>
19. Hockenberry MJ, Wilson D. *Wong's Essentials of Pediatric Nursing*. St. Louis: Mosby Elsevier; 2009.
20. Kementerian Pendidikan dan Kebudayaan RI. Penyebab Terlambat Bicara pada Anak [Internet]. Direktorat Pendidikan Anak Usia Dini. 2020. Available from: <https://paudikmasdiy.kemdikbud.go.id/artikel/pembebab-speech-delay-atau-keterlate-talk-pada-anak/>
21. Jalongo MR. *Early Childhood Language Arts*. 6th Editio. Pearson Education; 2013.
22. Mugianti S, Mulyadi A, Anam AK, Najah ZL. Faktor Penyebab Anak Stunting Usia 25-60 Bulan di Kecamatan Sukorejo Kota Blitar. *Journal of Ners and Midwifery*. 2018 Dec;5(3):268–78. <https://doi.org/10.26699/jnk.v5i3.ART.p268-278>
23. Kementerian Kesehatan RI. Permenkes No. 39 Tahun 2016 tentang Pedoman Penyelenggaraan Program Indonesia Sehat Dengan Pendekatan Keluarga [JDIH BPK RI]. Sekretariat Negara, 39 Indonesia: BN.2016/NO. 1223; 2016.
24. Soetjningsih CH. *Perkembangan Anak Sejak Pembuahan Sampai dengan Kanak-kanak Akhir*. 3rd ed. Jakarta: Kencana Prenada Media Group; 2018.