

The Understanding of Stunting on Cognitive Development in Adolescence

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Abstract

Background: Stunting, a condition characterized by impaired growth and development due to poor nutrition, is a serious issue that can have lifelong consequences. Unfortunately, it often stems from complex socio-economic problems that can make it difficult to address. Although prevention efforts are currently aimed at the general public, they overlook an important group: teenagers. Adolescents should be educated about stunting as part of their marriage preparation, as this can help prevent the condition in future generations.

Methods: This study was conducted using a cross-sectional design and Rasch analysis utilized an online platform which was distributed to a total of 165 participants. These individuals spanned a wide range of ages, falling between the ages of 15 and 45, and they resided in a total of 21 different cities and regencies throughout Indonesia.

Results: Demographic factors like city, gender, and educational background have a significant impact on an individual's awareness of stunting. As per research, women tend to have a better understanding of cognitive stunting than men. Moreover, people with tertiary education have the highest level of awareness regarding this issue, scoring at 1.54 Logit. Individuals with high school and vocational education backgrounds also demonstrate a decent level of comprehension towards stunting, with 1.53 and 1.39 Logit scores.

Conclusion: These findings highlight the importance of implementing stunting prevention measures in schools for adolescents. Educating young people about the importance of proper nutrition means we can work towards a future where stunting is no longer a significant health issue.

Keywords: *Stunting, adolescence, nutrition.*

INTRODUCTION

In some instances, a child's physical stature may not align with the growth expectations for their age. This phenomenon is known as stunting and occurs when a child's height is two or more standard deviations below the standard set by the World Health Organization (WHO). Stunting may be the result of insufficient nourishment, recurring infections, or

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chronic maladies during the first 1000 days of a child's life. It is important to identify and address stunting in children as it can have long-term consequences on their physical and cognitive development [1]. The Ministry of Health at BKKBN National Working Meeting recently released data from the Indonesian Nutrition Status Survey (SSGI) indicating a reduction in the prevalence of stunting in Indonesia. Specifically, the percentage of individuals affected by stunting decreased from 24.4% in 2021 to 21.6% in 2022. This noteworthy improvement highlights the positive impact of ongoing efforts to improve nutrition and promote healthy development in Indonesia [2]. While there has been a decline in stunting rates in Indonesia, it would be premature to assume that the issue has been completely resolved. Stunting remains a significant concern for the country's future, as it can negatively impact the quality of human resources and overall competitiveness. Therefore, measures must be taken to address this problem and ensure that the necessary resources are allocated to support the health and development of Indonesia's population. Failure to do so could have serious long-term consequences for the country's economic and social well-being [3]. We must continue to put forth efforts to prevent childhood stunting and the detrimental effects it can have on a child's physical and cognitive development. While progress has been made in this area, there is still much work to be done to ensure that all children have access to adequate nutrition and healthcare to prevent stunting from occurring [4]. The long-term consequences of childhood stunting can be severe and can impact a child's ability to learn, grow, and succeed later in life. Therefore, we must prioritize the prevention of childhood stunting and invest in programs and initiatives that can make a difference in the lives of children worldwide[4]

Stunting, a condition where a child's growth and development are hindered, affects not only their physical stature but also their cognitive and motor skills [5]. Research has shown that children who experienced prolonged stunting had significantly lower cognitive scores compared to those who were never stunted, with a difference of -2.10 (95% CI: -3.85, -0.35). This emphasizes the importance of proper nutrition and care for children during their critical growth and developmental stages [6]. A recent study has highlighted the potential long-term consequences of stunted growth in children. The research found that children with stunted growth tend to exhibit a lower IQ score, with a staggering 4.57 times lower score than their non-stunted peers. This puts them at a distinct disadvantage when it comes to developing the key skills needed for future success, including important human resources capabilities [7]. Specifically, their cognitive development may be limited, impeding their ability to remember information, write effectively, understand cause and effect, and acquire other critical skills. As a result, children who experience stunted growth may find it difficult to keep up with their peers who experience normal growth, potentially impacting their prospects and opportunities. [8]

The initial five years of a child's life, commonly referred to as the Golden Age, are of the utmost importance for their growth and development. Studies have shown that malnourishment or stunting during this critical phase can lead to significant metabolic changes in the brain, which can have a lasting impact on the child's cognitive and physical abilities [7]. Therefore, it is crucial to provide the necessary support and care to ensure that children receive optimal nutrition and care during this period [9]. On the other hand, a balanced nutritional intake is needed for the schema-forming cells of the nervous system to be able to connect quickly during the Golden Age. Schema is a framework in the mind of an individual that is used to organize and interpret information [10]. The process of forming schemas occurs when the child is still a baby through sensorimotor abilities during activities. This activity is recorded and stored in memory and will then increase the number of neurons [10]. So, the child's memory and abilities will be increasingly improved through the activities carried out. It is beneficial for a child to have good cognitive abilities, and adequate nutritional intake is also needed [11].

Studies have demonstrated that malnutrition during a child's first 1000 days of life is a significant contributor to stunting. Unfortunately, many parents are not able to provide their children with sufficient nourishment due to economic constraints [7], [12]. A recent investigation has revealed that a staggering 76% of families with stunted toddlers had an income below the regional minimum wage in East Java, Bali, and Tangerang. In Central Java, which has the lowest minimum wage, the situation is particularly dire. However, it is important to note that 36% of families who do not have stunted children also earn below the minimum wage. This is especially evident in Jakarta, where the minimum wage is Rp 4,901,798, according to Kompas News. These findings highlight the widespread issue of poverty and its impact on child nutrition, as well as the need for effective interventions to combat stunting in vulnerable populations [1]. Research has shown that the age at which couples get married can have an impact on the potential for stunting in their children. This is an important consideration for couples who are planning to start a family and want to ensure that their children grow up healthy and strong. By understanding the potential risks associated with getting married at a young age, couples can make informed decisions that will benefit their family in the long term [12]. According to a study conducted by [13], early marriage has the potential to contribute to stunting in children. The negative impact of early marriage is further compounded by the findings of Valeriani [14] who reported that such unions can result in domestic violence, maternal and infant mortality, and economic hardships caused by unemployment. These factors, in turn, have been found to have a detrimental effect on the growth and development of children. It is important to consider the short and long-term consequences of early marriage to promote healthy outcomes for both individuals and communities.

Understanding the impact of stunting on adolescents is of utmost importance to prevent it from taking root at an early age. To tackle this issue, outreach initiatives can be implemented. In the Bangka district, for instance, socialization activities have been planned for adolescents as part of a larger campaign geared toward preventing stunting. The overarching objective is to significantly reduce the stunting rate by 2023, thereby promoting better health outcomes for the population. [14]. The social environment is a significant factor in preventing stunting, a condition that has detrimental effects on children's physical, cognitive, and motor skills. To address this issue, public healthcare initiatives should aim to promote socialization, which can educate parents on how to prevent stunting in their children. The importance of such initiatives cannot be overstated, as stunting can have long-term consequences on a child's development [12]. Specifically, this article seeks to delve into the understanding of adolescents regarding the impact of stunting on children's cognitive development.

METHODOLOGY

Design, Procedure, and Participant

To accurately detect any temporary data collection issues, we employed the cross-sectional study approach. To conduct this study, we utilized an online platform in the form of a Google form, which was distributed to a total of 165 participants. These individuals spanned a wide range of ages, falling between the ages of 15 and 45, and they resided in a total of 21 different cities and regencies throughout Indonesia. Furthermore, the participants had varying levels of educational backgrounds, including those who had completed high school, vocational school, and university, as well as individuals who worked as teachers, educators, and lecturers. By gathering data from such a diverse group of individuals, we aimed to gain a comprehensive understanding of the issues that may arise when collecting data temporarily.

Data and statistical analysis

The Rasch model has been introduced as a means of measuring a respondent's ability to

work with an instrument. Researchers can utilize software such as WINSTEPS to conduct Rasch analysis and evaluate assumptions within the model. This study employed Rasch analysis to assess several factors related to the instrument, including its reliability, the degree of seriousness exhibited by respondents when completing it, the geographical distribution of understanding regarding stunting, the gender that exhibited the greatest understanding of stunting issues, and the level of understanding based on educational background. Additionally, the maximum and minimum number of respondents who worked on the instrument were taken into consideration. Overall, Rasch analysis provides a comprehensive and useful tool for researchers seeking to evaluate the effectiveness and efficacy of their instruments.

DISCUSSION AND RESULTS

RESULT

(Insert table 1 here)

According to the Rasch analysis, the reliability score for the respondents' answers in the questionnaire is 0.51, indicating a satisfactory level of consistency. The reliability score for the questionnaire items is 0.94, indicating their accountability. Therefore, the questionnaire used to collect data from respondents is considered valid.

Data collected from 165 respondents has revealed the following understanding of cognitive stunting:

- Cities

(Insert table 2 here)

Based on the gathered data, it was found that respondents from Jember, Purwakarta, Tangerang, and Tuban had the highest level of understanding of stunting and cognitive stunting issues, scoring a noteworthy 1.94 Logit. Conversely, the respondents from Bengkulu and Madiun obtained a lower understanding of these issues, as indicated by an RMSE value of 1.1 Logit. These findings suggest that further education and awareness campaigns could be beneficial in these areas to improve understanding and reduce the prevalence of stunting and cognitive stunting issues.

- Sex

(Insert table 3 here)

According to the questionnaire results, it was observed that female respondents exhibited a higher level of comprehension regarding the issue of stunting in comparison to their male counterparts. The logit value for females stood at 1.47, indicating a greater level of awareness, whereas the corresponding figure for males was 1.42 Logit.

- Education

(Insert table 4 here)

The presented table showcases a breakdown of the education levels of respondents who have demonstrated an understanding of the issue of cognitive stunting. Upon analyzing the data, it is evident that individuals with tertiary education have the highest level of awareness regarding the problem, scoring at 1.54 Logit. In second and third place, respectively, are individuals with high school and vocational education backgrounds, demonstrating a decent level of comprehension towards stunting. These findings suggest that higher education levels may be associated with a greater understanding of complex issues such as cognitive stunting.

- **Maximum Score and Minimum Score**

Based on the survey results, it was found that respondents with a tertiary education background obtained the highest score, comprising 43% of the total. This indicates that individuals who pursued higher education were more likely to perform better in the survey. Following closely behind were respondents with a vocational education background, accounting for 34% of the total. It is noteworthy, however, that respondents with a high school education background obtained the lowest score, making up only 23% of the total.

On the other hand, more than half respondents who received the lowest scores had an SMK education background, constituting 69% of the total. This implies that individuals who received vocational training may have struggled with the survey questions. Tertiary education graduates comprised 23% of the total respondents with the lowest scores, while only 8% of them were high school graduates. These findings suggest that respondents with a tertiary education background had the highest scores, while those with a vocational education background had the lowest scores.

DISCUSSION

Stunting problems in cognitive do not necessarily come suddenly without any cause. It came from the lack of understanding of providing better nutrition intake during a child's first 1000 days [15]. Parents with low educational levels tend to have limited understanding during pregnancy which leads to limited parenting skills. On the other hand, parents whose educational levels are higher tend to better understand information and apply it to a healthy lifestyle and parenting [16].

According to the data gathered, it was discovered that a significant number of participants who provided information on stunting had achieved a university level of education. This finding suggests that not all graduates from high school or vocational schools choose to pursue higher education, perhaps due to various reasons such as seeking employment opportunities. Upon further analysis of the questionnaire responses, it was observed that individuals with a university educational background had the highest maximum value, while those with a high school or vocational school background had the lowest minimum value.

It is of utmost importance to educate students about stunting, particularly those who attend high schools and vocational schools as they are often provided with lessons on human needs in marriage. However, such lessons should not only cover the understanding of human needs in marriage but also emphasize the significance of proper nutrition during pregnancy, the causes of stunting, how to prevent stunting, and family counseling [12]. Furthermore, it is essential to note that marrying at an early age may lead to financial instability, especially if the parents have limited education [17]–[19]. Therefore, educational institutions should ensure that students are equipped with the necessary knowledge and skills to make informed decisions about their future [16]. Families who possess ample financial resources are more capable of availing themselves of superior healthcare services that enable them to monitor the nutrition, immunization, and parenting of their children [19]. This, in turn, has a significant impact on reducing the incidence of child stunting, thereby promoting a healthier and more prosperous society.

According to recent statistics, it has been observed that in the East Java Province, approximately 28.73% of the population belonging to the age group of 15-19 are currently employed or actively seeking employment. With this data in mind, it can be inferred that a significant portion of the younger generation, upon completing their high school education or vocational training, may opt to either enter the workforce or pursue marriage.

According to city data, Bengkulu and Madiun have the lowest understanding of stunting, with respondents scoring 1.1 Logit. The 2022 Indonesian Nutrition Status Survey (SSGI)

shows that the average stunting rate in East Java is 19.1%, with Madiun's rate at 12.4%. However, this is expected to decrease to 9.7% by 2023. The low understanding of stunting in these cities indicates that there is still a need for more education on the topic. Schools should take a more active role in disseminating information about stunting to increase awareness.

According to the data, male respondents have a lack of understanding when it comes to stunting, with a result of 1.42 Logit. The current social construct assigns the responsibility of childcare solely to mothers, leaving fathers with only economic and decision-making tasks. This traditional division of labor results in a lack of involvement from fathers in domestic duties and childcare [20], [21] To address adolescent stunting, it is crucial to educate men on the importance of their role in caring for and raising their children alongside mothers. Emphasizing the participation of fathers in childcare is essential to promoting children's health and well-being [21]–[23].

Conclusion

Based on the currently available data, it appears that there is a significant gap in knowledge and awareness when it comes to the issue of stunting in adolescents. Although efforts are being made to prevent stunting among the general population, these initiatives are not proving to be fully successful in addressing the unique challenges faced by adolescents. To improve this situation, it is recommended that stunting prevention education be integrated into school services that are specifically tailored to meet the educational needs and characteristics of students. By doing so, teenagers who are approaching marriage age can be better equipped with the knowledge and skills necessary to prevent stunting and ensure optimal health outcomes.

Recommendations

Despite this research has limitations in methodology, we are fully hoping to elucidate this research onto interventions toward subjects.

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Conflict of Interest

There was not a conflict of interest in this research study,

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