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Raising Awareness of the Impact of Stunting on Toddler Development Through Parental Education

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Abstract

In 2023, the prevalence of stunting in Indonesia remains at 21.5%, showing only a marginal decrease of 0.1% from the previous year and still exceeding the WHO standard of 20%. Stunting adversely affects children, leading to impaired physical and cognitive development, increased risk of developmental disorders, and a higher likelihood of metabolic diseases in adulthood. This study utilized a multi-stage approach: data and area analysis, educational and developmental screening, and evaluation. Participants included 44 parents with their toddlers, 5 cadres, and 3 village officials. Knowledge among participants improved significantly, with 76% demonstrating enhanced understanding. Statistical analysis revealed a significant increase in knowledge post-intervention (p=0.000). Developmental assessments showed that 11% of toddlers were classified as "doubtful" and 23% as having "deviant" results. Parents of these children received education on age-appropriate stimulation, and cases were reported to local health workers. The goal is for the acquired knowledge to be widely applied, with ongoing routine screening for early detection and timely management of developmental issues.

Keywords Child's Development, Community Service, Malnutrition, Stunting, Parental Education

1. INTRODUCTION

Malnutrition is a critical public health issue, affecting over 900 million people globally. It occurs when nutritional intake is insufficient, encompassing both inadequate quantity and quality of food. Understanding this is crucial, as consuming energy-dense foods with poor nutritional value can lead to malnutrition (Martins et al., 2011). Malnutrition, particularly stunting, poses serious risks not only to the affected children but also to the future of a nation. Children with stunting may suffer from reduced physical and cognitive abilities, developmental disorders, and an elevated risk of metabolic diseases in adulthood. These consequences can place significant economic burdens on families and result in a loss of skilled human resources for the country (Santosa et al., 2022).

While the global impacts are well-documented, the case of Indonesia highlights the ongoing struggle against stunting. In 2023, Indonesia's stunting prevalence stands at 21.5%, reflecting a minimal decrease of just 0.1% from the previous year and remaining above the WHO's 20% threshold. In the Bangka Belitung Islands Province, the prevalence of stunted toddlers is 20.7%. Although this represents a decrease, it is not significant compared to previous years (Badan Kebijakan Pembangunan Kesehatan, 2024).

This community service focuses on the Bangka Belitung Islands, particularly West Bangka Regency, due to its disproportionately high stunting rates compared to other regions. This localized perspective allows for targeted intervention strategies, especially in areas like the Simpang Teritip Community Health Center, where stunting prevalence exceeds 20%. Understanding these regional disparities is crucial for addressing the root causes of malnutrition and for developing effective public health policies tailored to the specific needs of this community. (Ditjen Bina Pembangunan Daerah - Kementerian Dalam Negeri, 2022).

Addressing stunting in regions like West Bangka Regency is crucial not only because of the current high prevalence but also due to the long-term consequences of malnutrition in young children. Stunting, as part of malnutrition, poses severe risks to children's physical and cognitive development, leading to significant health issues that can persist into adulthood. These lasting effects underline the importance of early intervention, particularly in high-risk areas, to prevent the intergenerational transmission of malnutrition and improve overall public health outcomes. Additionally, malnutrition in children is associated with poor mental development, academic performance, and behavioral issues. However, the literature remains divided on whether these effects are permanent or reversible. Stunted children who

experience catch-up growth can achieve verbal vocabulary and quantitative test scores comparable to their non-stunted peers. Children treated for stunting before the age of 6 in day hospitals, who recover their weight and height, often show normal body composition, bone mineral density, and good insulin production and sensitivity (Martins et al., 2011).

Stunting reflects chronic malnutrition, which can significantly impact brain development, especially if nutritional deficiencies start from the prenatal period and continue into early childhood. Malnutrition disrupts brain development, affecting motor skills, cognitive function, language abilities, social-emotional growth, and overall mental development (Prado & Dewey, 2014).

Growth and development are interconnected processes that occur simultaneously. Disruptions in one area often affect other areas as well. Unfortunately, not everyone is aware of this principle. Previous research revealed that among 17 parents of stunted children, nearly all believed their children's development was normal (Imami et al., 2023)

Early intervention through parental education is crucial, as many parents may not recognize the signs of stunting or its developmental consequences. Research indicates that some parents of stunted children mistakenly believe their child's development is normal (Imami et al., 2023). Effective parental education can play a pivotal role in preventing the intergenerational transmission of malnutrition. Studies have shown that when parents are educated about proper nutrition and health practices, it can lead to improved nutritional status in children and a reduction in the incidence of stunting (Sukmawati et al., 2023).

In conclusion, early intervention through parental education is crucial in combating stunting. By equipping parents with the necessary knowledge and resources, we can foster healthier practices that not only improve the immediate nutritional status of children but also contribute to their long-term cognitive and physical development. This multifaceted approach is essential for breaking the cycle of malnutrition and its associated consequences. Thus, the author aims to educate mothers of children under five about the effects of stunting on child development.

2. METHODS

This community service activity was carried out over 7 (seven) months, January to July 2024. It began with a review of existing research on stunting prevalence and its impact on child development in the Bangka Belitung area. Initial findings indicated

that the Simpang Teritip Community Health Center in West Bangka Regency had high rates of stunting.

Following the determination of the activity location, an initial assessment was conducted to evaluate the area's conditions and provide a preliminary profile of the village population. The assessment revealed that Air Nyatoh Village had a high prevalence of stunting among children under five and lacked education on the impact of stunting on child development.

The community service involved three team members and five students from the Midwifery Department at Pangkal Pinang Health Polytechnic. The primary targets of this activity were toddlers and their parents. Activities are carried out in several stages:

a. Coordinate with local health workers, village officials, and cadres as well as related parties to analyze targets, namely mothers with toddlers
b. Examine the child's growth and development
c. Provide education regarding the impact of stunting on children's development
d. Evaluate the follow-up to problems, successes, and obstacles found during activities

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3. FINDINGS AND DISCUSSION

In general, the results of implementing community service carried out in several stages can be explained as follows:

3.1 Preparation and Situation Analysis

During this phase, the team conducted a general analysis of the problems at the Simpang Teritip Community Health Center. Interviews with midwives revealed a high occurrence of stunting in several areas, particularly in Air Nyatoh Village. The impact of stunting on child development had not been widely communicated to the community in the village. Permits were obtained from the West Bangka District Health Service on March 18, 2024, with approval granted on March 28, 2024. Additional permissions were obtained from the Head of Air Nyatoh Village on May 21, 2024. On May 28, 2024, midwives were interviewed to discuss the activities' implementation, schedule, and participants (Figure 1).

Figure 1. Interview with Midwife at Simpang Teritip Community Health Center

3.2 Detection of Stunting and Developmental Disorders in Toddlers

This phase involved screening for stunting and developmental disorders among toddlers, conducted on May 29, 2024. A total of 44 toddlers were examined for growth (stunting) and developmental issues using the Pre-Developmental Screening Questionnaire appropriate for their age. Gender and age were recorded, followed by anthropometric measurements and developmental examination (Figure 2). The results showed that 66% of the toddlers had "appropriate" development, 11% had "doubtful" results, and 23% showed "deviations" (Figure 3). Those with doubtful results were advised to return for a follow-up examination within two weeks, while those with deviations were referred to midwives for further care.

Figure 2. Examine the child's development

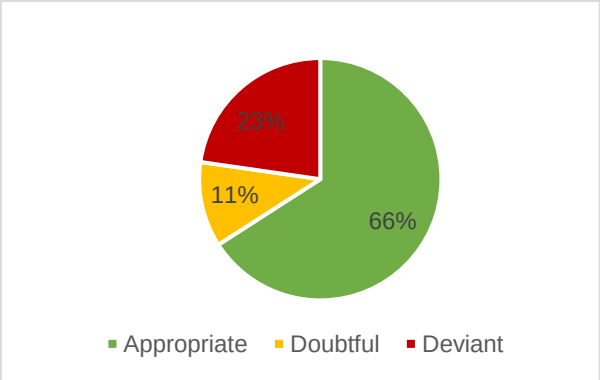

Figure 3. Percentage of Interpretation of Development Examination Results

Stunting, characterized by inadequate growth and development due to factors like malnutrition, has significant implications for child development. The World Health Organization's conceptual framework highlights that stunting can impact children's growth and development both in the short and long term (Suharsih & Rahayu, 2023). The consequences of stunting extend beyond physical growth, significantly impacting cognitive, emotional, and social development. Research indicates that children who experience stunting are at a higher risk of cognitive deficits, which can lead to poor academic performance and reduced productivity in adulthood (Vaivada et al., 2020).

The implications of stunting on cognitive development are particularly concerning during the critical early years of life. Studies have shown that the first 1,000 days from conception to a child's second birthday are crucial for brain development, and malnutrition during this period can lead to irreversible damage (Puspitasari et al., 2021). Children who are stunted are more likely to experience developmental delays, including speech and motor skills, which can affect their overall ability to interact socially and emotionally with peers (Wake et al., 2023).

The adverse impact of stunting on optimal cognitive development underscores the importance of integrating health, nutrition services, and early learning programs to support children's cognitive development effectively (Ekholuenetale et al., 2020). Moreover, childhood stunting has been associated with poor cognitive development later in life, leading to reduced educational outcomes (Akbar et al., 2023). Additionally, stunting is prevalent among children in various regions, with rural areas showing higher rates of stunting compared to urban areas (Koshy et al., 2022; Ponum et al., 2020).

3.3 Education

On the same day, May 29, 2024, education was provided to the parents of toddlers aged 2 to 5 years about the effects of stunting on child development. The education took place at the Air Nyatoh Village Hall, attended by the parents of 44 toddlers, 5 cadres, and 3 village officials.

Figure 4. Pre-test before education

Participants were given a pre-test before the education session to assess their basic knowledge (Figure 4). There was some confusion among the participants regarding the pre-test, but it was clarified that the pre-test was intended to measure initial knowledge without requiring thorough discussions or considerations. After clarification, participants completed the pre-test in an orderly manner.

Figure 5. Educate Participants about the Prevention and Impact of Stunting

Education included topics on preventing stunting and its effects on child development, using multimedia presentations to enhance understanding (Figure 5). The equipment used is a laptop, projector, and loudspeakers. Several videos were also played as audio-visual support in the hope that the material would be easier for participants to remember and understand. A post-test was conducted afterward, revealing a significant improvement in participants' knowledge compared to the pre-

test (Figure 6). Statistical analysis confirmed the increase in knowledge, as shown by the Wilcoxon test results (Table 1).

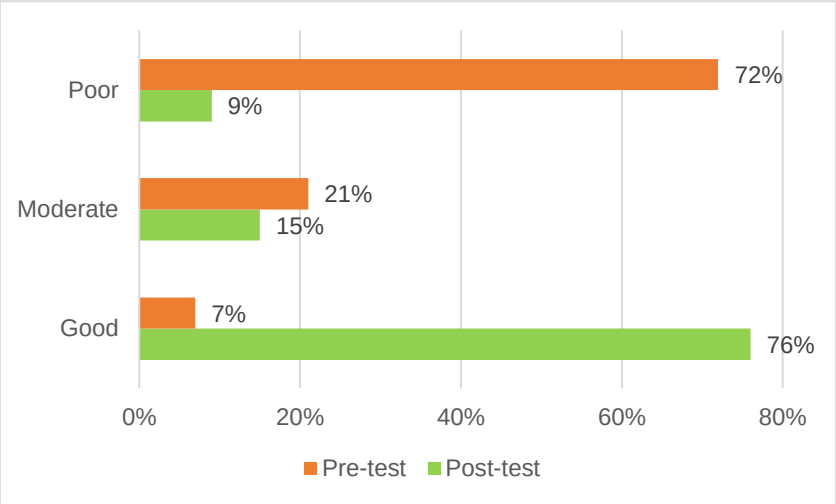

Figure 6. Comparison of Pre-test and Post-test Scores

In Figure 6 it can be seen that there has been a significant shift in the graph in the proportion of participants' knowledge assessments before and after the education. In the pre-test results, the majority of participants were in the poor knowledge category (72%) and the fewest participants in the category were participants with good knowledge (7%). After that, in the post-test, the results were the best, where the majority of participants had good knowledge (76%) and only 9% or a small percentage of participants had poor knowledge.

Following the educational intervention, there was a significant improvement in the knowledge levels of participants. The "good knowledge" category expanded from a mere 7% to a commanding 76%. This indicates that the majority of participants gained substantial understanding from the session, moving from poor or moderate knowledge to a strong grasp of the material. The proportion of participants with "poor knowledge" dropped sharply from 72% to just 9%, demonstrating that the educational content effectively addressed the gaps in knowledge.

Table 1. Result of Paired t-test

	n	**Median**	**p**
Knowledge score before education	44	6 (4-10)	0,000
Knowledge score after education		8 (6-10)	

Note: Wilcoxon test: no participant's knowledge decreased, 8 remained the same and 36 increased

The results presented in Table 1 corroborate the findings in Figure 6, where a significant improvement in knowledge was observed following the educational

session. The Wilcoxon test, chosen because the data did not follow a normal distribution (as indicated by the Shapiro-Wilk test with $p<0.05$), confirmed that there was a statistically significant difference in participants' knowledge before and after the education ($p=0.000$). The p-value of 0.000 indicates that the likelihood of observing such a difference by chance is extremely low, reinforcing the conclusion that the educational intervention had a meaningful impact on participants' knowledge.

Education and health promotion are crucial in increasing knowledge to prevent stunting in children. Several studies have demonstrated the effectiveness of various educational methods and health promotion strategies in enhancing awareness and understanding of stunting prevention. For example, health education lectures and audio-visual media have been shown to significantly increase knowledge about stunting prevention (Nurhayati et al., 2023; Tyarini et al., 2024). Additionally, community empowerment programs and nutrition and psychosocial stimulation modules have proven effective in improving knowledge, attitudes, and skills related to stunting prevention (Lukman et al., 2023; Mulyanti et al., 2023).

Maternal education has been highlighted as a significant factor influencing knowledge about stunting prevention (Nurhayati et al., 2023). Health education based on local wisdom and the use of technology have been identified as valuable tools in educating communities and nursing students about stunting prevention (Astuti et al., 2023; Elis et al., 2020). Furthermore, the role of health workers in promoting stunting prevention strategies has been emphasized (Faizi et al., 2022). Efforts to prevent stunting through education and promotion have been found to positively impact mothers' knowledge and attitudes toward stunting prevention (Siburian & Ritonga, 2023). The involvement of cadres in providing nutrition education and stimulation has been instrumental in preventing and managing stunting (Chabibah et al., 2023). In conclusion, education and health promotion initiatives are essential in increasing knowledge and awareness to prevent stunting. By empowering communities, educating mothers, and utilizing various educational methods, significant progress can be made in reducing the incidence of stunting and improving the health outcomes of children.

3.4 Evaluation

The follow-up evaluation, conducted a month after the initial activities, provides critical insights into the ongoing impact of stunting prevention and child development intervention. This evaluation focused on reassessing toddlers who had previously shown "doubtful" or "deviation" results in their developmental screenings.

One month after the initial assessment, all toddlers who had previously received "doubtful" results were re-examined. The persistence of "doubtful" results in two respondents indicates that while the initial intervention may have provided some benefits, these children still require further monitoring and additional interventions. The recommendation for parents to continue stimulating their children and return for another check-up in two weeks suggests that these toddlers are at a critical juncture. Continued stimulation and close monitoring are essential to prevent potential developmental delays from becoming more pronounced.

For toddlers identified with developmental deviations, the evaluation process involves more intensive monitoring by village cadres and midwives. The plan for continuous stimulation by parents, guided by the developmental age of the children, is a proactive approach to addressing these deviations.

The periodic checks to assess progress are crucial for ensuring that these toddlers receive the support they need to catch up developmentally. This ongoing assessment helps to identify any further interventions that may be required and ensures that parents remain engaged and supported throughout the process.

Figure 7. The Team, Participants, and Local Government

4. CONCLUSION

This community service activity successfully increased knowledge in Air Nyatoh Village, within the jurisdiction of the Simpang Teritip Community Health Center in West Bangka Regency. The fact that 36 participants showed improved understanding, with none reporting a decline, underscores the effectiveness of these interventions in diverse populations. Moreover, toddlers classified as 'Doubtful' and 'Deviant' in their development were identified, further emphasizing the need for early detection and intervention.

The success of this initiative highlights the importance of sustaining similar educational efforts, especially in communities where awareness about stunting and its prevention remains limited. Continued support is vital, as both the local community and health workers have expressed a strong desire for these programs to persist. Collaboration among the community, health professionals, and local leaders is crucial to ensuring that these positive changes are maintained and expanded.

During this community service, it became clear that in areas with a high prevalence of stunting, several children displayed signs of developmental delays. This reinforces the understanding that stunting impacts not only physical growth but also cognitive development, academic performance, and long-term productivity. Tackling stunting requires a holistic approach that combines nutritional support, health services, and early learning interventions to mitigate its harmful effects on child development.

Furthermore, preventing stunting hinges on increasing parental knowledge. Empowering parents with the right information equips them to make informed decisions that promote their children's growth and overall well-being. While education alone is not a silver bullet, it is a critical component of a multi-faceted approach to prevent stunting and promote healthy development in children.

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