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RESEARCH ARTICLE

Analysis of Factors Associated With Stunting Incidence in Wetland Areas (Case Study in Banjar Regency)

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ABSTRACT

Stunting is a major public health issue and a national priority in Indonesia. This study aims to analyze factors associated with stunting among children under five in wetland areas, focusing on a case study in Banjar Regency, South Kalimantan. A quantitative method with a cross-sectional approach was employed. Data were collected through structured questionnaires and anthropometric measurements involving 200 children under five, along with the socioeconomic and environmental characteristics of their families. The results revealed that factors such as nutritional intake, maternal education level, access to healthcare services, clean water quality, and sanitation were significantly associated with stunting. Environmental factors unique to wetland areas, such as limited access to clean water sources and high humidity levels, further exacerbated the children's health conditions. The study concludes that preventing stunting in wetland areas requires a multidimensional approach involving improved access to healthcare services, provision of basic infrastructure, and increased community awareness of nutrition importance.

INTRODUCTION

Stunting in children under five is defined as impaired height growth compared to age, where the measurement results are recorded at more than -2 SD of the growth median set by WHO. WHO states that stunting impacts suboptimal cognitive and physical development, increases the risk of degenerative diseases in adulthood, and reduces productivity and income levels by 20% (WHO, 2014). The high prevalence of stunting in many districts/cities in Indonesia is linked to the effectiveness of policies in addressing this issue, including socio-cultural aspects (environment policy) and the interrelation of policies implemented by the government. Socio-cultural factors significantly influence the acceleration or deceleration of stunting prevalence (Aridiyah et al., 2015; Yuwanti et al., 2021).

The 2018 Basic Health Research (Riskesdas) showed a stunting prevalence of 30.8% (Kemenkes RI, 2019). The following year, the prevalence decreased to 27.7%, according to the 2019 Indonesian Toddler Nutritional Status Study (SSGBI), and further declined to 24.4% in the 2021 Indonesian Nutritional Status Study (SSGI) (BPS 2019; Kemenkes RI, 2021). Despite this declining trend, these figures remain above the national target of 22% by 2025 and the RPJMN 2020-2024 target of 14% by 2024 (Ministry of Human Development and Culture, 2019).

According to SSGI 2021 data, South Kalimantan Province ranked sixth in stunting prevalence, exceeding the national prevalence at 30%. Banjar Regency recorded the highest stunting rate in South Kalimantan Province at 40.2% in 2021, an increase from 38.97% in 2019. The World Health Organization (2013) classifies the causes of stunting in children into four major categories: family and household factors, inadequate complementary feeding, breastfeeding, and infections. Family and household factors are further divided into maternal factors and home environment factors. Maternal factors include poor nutrition during preconception, pregnancy, and lactation; short maternal stature; infections; child marriage; teenage pregnancies; mental health issues; intrauterine growth restriction (IUGR) and preterm births; short pregnancy intervals; and hypertension. Home environment factors include inadequate stimulation and child activity, lack of care, poor sanitation and water supply, limited food access and availability, inappropriate household food allocation, and low caregiver education (WHO, 2013).

As WHO's theory suggests, maternal factors such as child marriage and teenage pregnancies are risk factors for stunting. According to data from the Ministry of Women's Empowerment and Child Protection (PPPA) in 2018, the child marriage rate in South Kalimantan Province was 17.63%, exceeding the national rate of 11.21%, making it the fourth-highest province for marriages under 18 years old (Kementerian PPPA, 2018). A study by Yulius et al. (2020) showed a significant relationship between child marriage and stunting in children under five ($p=0.01$). In addition to child marriage, inadequate nutrition during preconception, pregnancy, and lactation also poses a risk for stunting. This can occur due to food taboos still prevalent in society. A study by Zahroh FF (2020) indicated a significant relationship between food taboos and stunting ($p=0.000$). Food taboos in Indonesia remain an issue, as many foods that should be consumed are still considered taboo. As a result, pregnant and lactating mothers avoid certain foods, reducing their nutritional intake, ultimately affecting the nutritional status of both mothers and their children, with stunting as one of the long-term impacts (Meitria et al., 2020).

The impact of nutritional deficiencies during the first 1,000 days of life not only affects physical development but also cognitive development, influencing intelligence, critical thinking skills, and work productivity. Stunted children often grow into adults with lower quality of life. If this condition occurs in children aged 0-2 years, there is a high probability that they will not reach their expected potential height, and their brain development will be suboptimal, resulting in difficulties in achieving academic success (Atmarita, 2010). Based on the above background, this study aims to analyze the risk factors associated with stunting among children under five in Banjar Regency.

RESEARCH METHOD

This study employs a mixed-methods design, combining quantitative research with a cross-sectional approach and qualitative research with a sequential explanatory design. The population for the quantitative research comprises children under five in Banjar Regency, specifically in districts identified as stunting loci (Martapura Barat District). The sample for the quantitative study, referred to as respondents in this research, was determined using simple random sampling. The sample size was calculated based on the theory of Frankel and Wallen (1993), which states that the minimum sample size is 50 participants. The inclusion criteria were children under five who had not experienced any infectious diseases in the past six months. Informants for the qualitative research included relevant Regional Work Units (SKPD) involved in stunting management programs in the regency.

RESULTS AND DISCUSSION

Quantitative data were analyzed univariately using frequency distribution tables and bivariately using the chi-square test. The results and discussion related to this study are as follows:

Stunting Status in Children Under Five

The stunting status of children under five in Martapura Barat District, Banjar Regency, and Sungai Pandan District can be observed in the graph below.

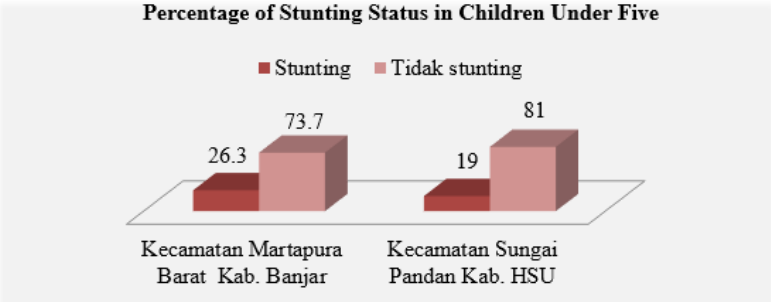

Figure 5.1 Percentage of Stunting Status in Children Under Five

Based on the graph above, it is evident that the majority of children under five in both Martapura Barat District and Sungai Pandan District do not experience stunting. However, among all respondents, there are still children identified as stunted, with a prevalence of 26.3% in Martapura Barat and 19% in Sungai Pandan. These percentages are concerning because, according to the World Health Organization (WHO), a stunting prevalence above 20% still constitutes a public health issue (Sarman & Darmin, 2021). Furthermore, these figures have not yet reached the target set in the 2020–2024 National Medium-Term Development Plan (RPJMN), which aims for a stunting prevalence of 14% by 2024.

Stunting is a condition in which a child has a height or length below the standard for their age. It is a key indicator of long-term nutritional deficiencies that result in impaired linear growth (Pratiwi, Sari, & Ratnasari, 2021). Stunting is identified by comparing a child's height to the standard height for children of the same age and gender in a normal population. A child is classified as stunted if their height falls below -2 SD based on WHO standards (Indonesian Ministry of Health, 2020). The height-for-age index (PB/U or TB/U) reflects a child's growth in terms of length or height relative to their age. This index can identify children who are short (stunted) or very short (severely stunted), which is caused by prolonged nutritional deficiencies or frequent illnesses (Indonesian Ministry of Health, 2020).

Stunting results from multiple factors, including low birth weight, inadequate stimulation and childcare, poor nutritional intake, recurrent infections, and various environmental factors (Nugroho, Sasongko, & Kristiawan, 2021). The short-term effects of stunting include impaired brain development, reduced intelligence, physical growth disorders, and metabolic dysfunctions. Long-term consequences include diminished cognitive abilities, poor academic performance, weakened immunity making children more prone to illness, and a higher risk of developing diabetes, obesity, heart disease, vascular disease, cancer, stroke, and disabilities in old age. These factors affect human resource quality, productivity, and competitiveness (Pratiwi et al., 2021).

Human resources are among the most critical factors influencing a nation's progress. Quality human beings must possess good health, with maternal and child health being a priority (Fauza et al., 2022). Optimal nutritional fulfillment for children should begin during the first 1,000 days of life, starting from early pregnancy to a child's second birthday, a period known as the "golden age." The golden age represents a critical window of rapid growth and development in a child's life (Nugroho et al., 2021). Beyond the age of two, maintaining proper nutritional intake remains essential, as children under five are particularly vulnerable to diseases and nutritional problems, including stunting (Pratiwi et al., 2021).

Age at First Marriage

The frequency distribution of the age at first marriage of respondents in Martapura Barat District and Sungai Pandan District can be seen in the following table:

Table 5.1 Frequency Distribution of Age at First Marriage in Martapura Barat District and Sungai Pandan District

Category	Frequency	Percentage (%)
Martapura Barat District (n=76)		
≤19	28	36,8
>19	48	63,2
Sungai Pandan District (n=63)		
≤19	17	27
>19	46	73

Based on the table above, it is known that most respondents in Martapura Barat District and Sungai Pandan District first married at the age of >19 years. According to Law Number 16 of 2019, this age category is not considered early marriage because, according to the law, early marriage refers to a marriage conducted at an age <19 years for both men and women. However, when compared with the indicators set by the National Population and Family Planning Board (BKKBN), which defines early marriage as a marriage conducted by women at an age younger than 21 years, it can be said that some of the respondents married at an age that is less ideal. The Marriage Age Maturation (PUP) program launched by BKKBN aims to increase the age at first marriage so that the minimum age at first marriage is achieved, which is 21 years for women and 25 years for men. Marriage Age Maturation (PUP) is not just about postponing marriage until a certain age but ensuring that the first pregnancy occurs at a sufficiently mature age. It is hoped that this will reduce the total fertility rate (TFR) (Adzlan, 2011).

As the theory proposed by WHO suggests, maternal factors such as child marriage and teenage pregnancy are risk factors for stunting. According to data from the Ministry of Women's Empowerment and Child Protection (Kementerian PPPA) in 2018, the early marriage rate in South Kalimantan Province was 17.63%, which is higher than the national rate (11.21%), and South Kalimantan Province ranked 4th highest for marriages under 18 years old (Kementerian PPPA, 2018). A study conducted by Yulius et al. (2020) showed a relationship between early marriage and stunting in toddlers (p=0.01).

The analysis of the relationship between age at first marriage and stunting can be seen in the table below.

Table 5.2 Relationship Between Age at First Marriage and Stunting Incidence in Martapura Barat District

Age at First Marrige	Inccidence of Stunting				Total		P-Value
	Stunting		Normal				
	n	%	n	%	n	%	
≤19	6	21,4	22	78,6	28	100	0,460
>19	14	29,2	34	70,8	48	100	

Based on the table above, it is known that there is no relationship between age at first marriage and the incidence of stunting in Martapura Barat District, Banjar Regency (p=0.460). The results of the statistical test show that there is no relationship between the mother's age at first marriage and the occurrence of stunting in toddlers, both in Martapura Barat District and in Sungai Pandan District. These findings are consistent with research conducted by Permatasari C (2022), which found no significant difference between the mother's age at marriage and the incidence of stunting (p=0.799). In line with this research, a study by Zulhakim et al. (2022) also stated that there is no meaningful relationship between early marriage and the occurrence of stunting (p=0.664). This could occur because age at marriage is not a direct factor causing stunting. A mother who marries at an ideal age but has poor parenting patterns, along with economic factors, education, and local customs, especially during the First 1000 Days of Life (HPK), will influence nutritional intake and directly impact stunting.

Although there is no relationship between age at marriage and stunting, marrying at an ideal age, especially for women, is important. A mother who is pregnant at a young age is still in her growth phase, so there may be a competition for nutritional intake between the fetus and the mother. This competition for nutrients will worsen if the mother's nutritional intake is inadequate, causing delayed fetal development. This situation increases the risk of the baby being born with low birth weight, which is a factor contributing to stunting in children under two years of age (baduta). Pregnancy at an early adolescent age, when the mother is still growing, increases the risk of the baby being born stunted (Larasati et al., 2018).

DISCUSSION

The results presented in the table above indicate that there is no statistically significant relationship between age at first marriage and the incidence of stunting in Martapura Barat District, Banjar Regency (p=0.460). This finding suggests that the mother's age at marriage does not directly influence the likelihood of stunting in toddlers, both in Martapura Barat and Sungai Pandan Districts. This is consistent with the findings of Permatasari C (2022), who also found no significant difference between maternal age at marriage and stunting incidence (p=0.799). Similarly, a study by Zulhakim et al. (2022) reported no meaningful relationship between early marriage and the occurrence of stunting (p=0.664).

The absence of a significant relationship between age at first marriage and stunting can be attributed to several indirect factors that contribute to stunting in children. While age at marriage may not directly cause stunting, it is essential to recognize that other socio-economic, cultural, and health-related factors play a more prominent role. Mothers who marry at an ideal age may still face challenges that contribute to stunting if they have poor parenting practices or if they experience economic difficulties. Education, access to healthcare, and local customs can also significantly affect child nutrition and overall health, particularly during the critical first 1000 days of life (HPK). These

factors, which directly impact a child's growth and nutritional intake, are often more influential than the mother's age at marriage.

Moreover, the timing of marriage and childbirth remains crucial, especially for women, as early pregnancies are associated with higher risks. Mothers who marry at an ideal age, generally after they have completed their physical and emotional development, are more likely to be able to provide better care and nutrition for their children. In contrast, adolescent mothers, who are still in their own growth phase, may face additional health risks that can affect fetal development. During adolescence, the mother's body is still developing, and there is a competition for nutrients between the growing mother and the fetus. If the mother's nutritional intake is inadequate, it can lead to delayed fetal growth and potentially result in low birth weight. This is a significant risk factor for stunting in young children.

The occurrence of low birth weight due to inadequate maternal nutrition can exacerbate the risk of stunting. Infants born with low birth weight are more likely to experience growth delays, which can persist throughout their early childhood. Furthermore, early pregnancies, particularly in adolescence, are associated with an increased risk of stunting, as adolescent mothers are not only physically immature but may also lack the financial resources, emotional maturity, and knowledge to provide optimal prenatal and postnatal care (Larasati et al., 2018).

In addition, the interaction between maternal education, socio-economic status, and nutrition is critical in determining the child's growth trajectory. Education plays a vital role in improving maternal knowledge about proper nutrition, health care, and child-rearing practices. Economic constraints can limit access to sufficient and nutritious food, healthcare services, and other resources necessary for child development, further exacerbating the risk of stunting.

Thus, while age at first marriage is an important demographic factor, it must be understood within a broader socio-economic and cultural context. Policymakers should consider multiple facets of child development, including maternal health, nutrition, education, and socio-economic support systems, when designing interventions to address stunting. Programs focusing on the first 1000 days of life, maternal nutrition, and parenting education, alongside efforts to reduce early marriage, are essential to combat the prevalence of stunting and ensure the healthy growth of children.

CONCLUSION

In conclusion, the analysis of the relationship between age at first marriage and the incidence of stunting in Martapura Barat Districts reveals no statistically significant correlation ($p=0.460$). This suggests that age at first marriage alone does not serve as a direct determinant of stunting in children, reinforcing the findings of previous studies (Permatasari C, 2022; Zulhakim et al., 2022), which also observed no significant relationship between early marriage and stunting outcomes.

However, while the absence of a direct link between age at first marriage and stunting is evident, it is crucial to acknowledge that other socio-economic and health-related factors play a more substantial role in determining stunting risks. Factors such as maternal nutrition, education, economic status, and healthcare access are all integral to the child's growth and development, particularly during the critical first 1000 days of life. These elements can have a far greater impact on the incidence of stunting than the timing of marriage.

The findings also emphasize the importance of marrying at an ideal age, especially for women, as adolescent pregnancies pose increased risks to both maternal and child health. Adolescent mothers are still physically developing, which can lead to competition for nutrients between the fetus and the mother. This can result in low birth weight and delayed growth, both of which are significant risk factors for stunting.

In light of these findings, interventions aimed at reducing stunting should not solely focus on delaying marriage but should adopt a holistic approach. Programs should address maternal health, nutrition, education, and socio-economic support systems, alongside efforts to reduce early marriages. By improving the overall health and well-being of mothers and children, we can significantly reduce the prevalence of stunting and ensure healthier future generations. This comprehensive approach is essential in tackling the root causes of stunting and promoting sustainable improvements in child health and development, particularly in regions with high rates of early marriage and stunting.

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