

The Relationship Between Mother's Age During Pregnancy and the Severity of Stunting in Toddlers Aged 6-24 Months at Bagu Health Center

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Abstract

Stunting among toddlers remains a major public health problem, particularly in West Nusa Tenggara Province, Indonesia. Stunting is a multifactorial condition that can impair physical growth and adversely affect cognitive, verbal, and motor development. This study aimed to analyze the relationship between mother's age during pregnancy and the severity of stunting in toddlers aged 6–24 months at Bagu Health Center. This observational analytic study employed a cross-sectional design. The study population consisted of 43 mothers with stunted toddlers aged 6–24 months, who were selected using a total sampling technique. Data were collected from Maternal and Child Health (MCH) books and questionnaires. Bivariate analysis was performed using Fisher's exact test. The results showed that 36 mothers (83.7%) became pregnant at an ideal age, 6 mothers (14.0%) at an older age, and 1 mother (2.3%) at a young age. Fisher's exact test yielded a p-value of 0.785 ($p > 0.05$), indicating no statistically significant relationship between mother's age at pregnancy and the severity of stunting in toddlers aged 6–24 months at Bagu Health Center.

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1. PENDAHULUAN

The high incidence of child marriage is a critical global concern [1]. Based on 2023 UNICEF data, Indonesia ranks fourth highest globally for child marriage cases [2]. At the national level, the 2024 Susenas BPS data recorded West Nusa Tenggara (NTB) Province as the region with the highest child marriage rate in Indonesia, reaching 14.96%, which significantly exceeds the national average of 5.90% [3]. Locally, the NTB Provincial DP3AP2KB (2022) reported Central Lombok Regency as the area with the highest rate of child marriage in NTB, standing at 48.64%. This condition indicates that child marriage, particularly in Central Lombok Regency, has reached a concerning level [4]. A direct consequence of widespread child marriage is the elevated risk of first pregnancies occurring during childhood [5]. In fact, pregnancy represents a crucial period that determines a child's physical and psychological growth and development into late adulthood [6]. Pregnancy at a very young age is categorized under the "4 Too's" risk factors (Too young, Too old, Too close, and Too many), which increases the risk of various health problems for both mother and child, ultimately leading to undernutrition as a precursor to stunting [5], [7].

Stunting is a major threat to the quality of human resources in Indonesia. In the short term, stunting can impair verbal and motor development, cognitive function, physical growth, and metabolic processes. In the long term, stunting may result in suboptimal physical stature, increased susceptibility to disease, impaired reproductive health, and a higher risk of non-communicable diseases such as cardiovascular disease, cancer, obesity,

and diabetes [8]. The prevalence of stunting in NTB remains relatively high compared with other provinces in Indonesia. Data from the 2024 Indonesian Nutritional Status Survey (SSGI) showed that the prevalence of stunting in NTB was 23.5%, the third highest nationally [9]. According to the 2022 SSGI, Central Lombok Regency had the highest prevalence of stunting in NTB, at 13.34%. Specifically, Bagu Village was classified as a red zone for underweight (16.29%) and wasting (6.09%), with a stunting prevalence of 11.22% [10]. The phenomena of adolescent pregnancy and its potential impact on stunting represent an interconnected chain of health problems [5], [11]. Considering the substantial consequences associated with both conditions and the lack of empirical evidence examining their relationship in the local setting, this study aimed to analyze the relationship between mother's age during pregnancy and the severity of stunting in toddlers aged 6–24 months at Bagu Health Center.

2. RESEARCH METHODS

This observational analytic study employed a cross-sectional design and was conducted in the working area of Bagu Health Center, Central Lombok Regency, from July to December 2025. The study received ethical approval from the Faculty of Medicine and Health Sciences, University of Mataram. The study population consisted of mothers of toddlers aged 6–24 months who had been diagnosed with stunting. Participants were selected using total sampling, resulting in a total sample of 43 respondents who met the inclusion criteria. The inclusion criteria were having and consenting to access to the Maternal and Child Health (MCH) book, residing in the study area, and providing written informed consent. The exclusion criteria were children with congenital abnormalities, a history of low birth weight (LBW), or a history of preterm birth before 37 weeks of gestation.

The independent variable was maternal age at pregnancy, categorized as young, optimal, and advanced maternal age. The dependent variable was stunting severity, categorized as stunted and severely stunted based on the length/height-for-age Z-score (LAZ/HAZ) recorded in the MCH book. Primary data, including age at marriage, educational level, history of infection, and household income, were collected using a structured questionnaire. Data were processed and analyzed using Jamovi version 2.6.44. The analysis consisted of descriptive univariate analysis and bivariate analysis using Fisher's exact test to examine the association between mother's age during pregnancy and the stunting severity.

3. RESEARCH RESULTS AND DISCUSSION

3.1.Result

3.1.1.Characteristics of Respondents

This study involved 43 mothers with toddlers aged 6–24 months diagnosed with stunting in the working area of Bagu Public Health Center, Central Lombok Regency, who met the inclusion and exclusion criteria. The characteristics of the respondents are presented in Table 1

Table 1. Characteristics of Respondents

Category	Subcategory	(n)	(%)
Toddler's sex	Male	25	58.1
	Female	18	41.9
Mother's age at marriage	Child marriage	10	23.3
	Ideal age at marriage	33	76.7

Stunting	Stunted Severely stunted	27 16	62.8 37.2
Mother's age during pregnancy	Too young Ideal Too old	1 36 6	2.3 83.7 14.0
Monthly household income	Below the regional minimum wage (<IDR 2,610,281) Above the regional minimum wage (>IDR 2,610,281)	38 5	88.4 11.6
Mother's education attainment	Did not complete primary school Complete primary school Complete junior high school Complete senior high school Higher education graduate	2 3 11 21 6	4.7 7.0 25.6 48.8 14.0
History of recurrent maternal infection during pregnancy	Yes No	14 29	32.6 67.4
Total		43	100

Based on Table 1, the majority of toddlers with stunting were male (58.1%). Most mothers were married at the ideal age (76.7%) and had completed senior high school as their highest level of education (48.8%). The majority of mothers reported no history of recurrent infection during pregnancy (67.4%). In terms of economic status, most respondents had a monthly household income below the regional minimum wage (RMW) of Central Lombok Regency (88.4%). Based on nutritional status assessment using length/height-for-age (LAZ/HAZ), 62.8% of the toddlers were classified as stunted, while 37.2% were classified as severely stunted. Most mothers became pregnant at the ideal reproductive age (83.7%).

3.1.2. Association Between Maternal Age at Pregnancy and Stunting Severity

Bivariate analysis was conducted to examine the relationship between mother's age during pregnancy and the severity of stunting in toddlers aged 6–24 months at Bagu Health Center. The results of the analysis are presented in Table 2.

Table 2. Association Between Maternal Age at Pregnancy and Stunting Severity

Mother's age at pregnancy	Stunting Severity				<i>p-value</i>
	Stunted	Severely Stunted			
	n	%	n	%	
Too young	1	2.3	0	0.0	0.785
Ideal	23	53.5	13	30.2	
Too old	3	7.0	3	7.0	
Total	27	100	16	100	

Based on Table 2, the bivariate analysis testing the relationship between mother's age during pregnancy and stunting severity using Fisher's Exact Test yielded a *p*-value of 0.785 ($p > 0.05$). This indicates that there is no statistically significant relationship between mother's age during pregnancy and the severity of stunting among toddlers aged 6–24 months in the working area of Bagu Health Center, Central Lombok Regency. Specifically, among mothers pregnant at a very young age, 1 mother (2.3%) had a toddler classified as

stunted, while none (0.0%) had a toddler classified as severely stunted. Among mothers who were pregnant at an ideal age, 23 (53.5%) had toddlers classified as stunted and 13 (30.2%) had toddlers classified as severely stunted. For mothers pregnant at an older age, 3 (7.0%) had toddlers classified as stunted and 3 (7.0%) had toddlers classified as severely stunted.

3.2. Discussion

3.2.1. Characteristics of Respondents

Based on the study data involving 43 respondents, male toddlers were more predominant (58.1%) compared to females (41.9%). This aligns with the theory that male toddlers require higher energy and protein intake and tend to be more physically active outdoors, making them more vulnerable to stunting [12], [13]. Based on mother's age at marriage, the majority of mothers married at the ideal age of 19 years or older (76.7%), while 23.3% married during childhood. Marriage under 19 years of age increases the risk of stunting because the reproductive organs are not yet fully mature, and maternal knowledge is often sub-optimal due to interrupted education [14], [15]. Regarding the nutritional status of toddlers, 62.8% were categorized as stunted (length/height-for-age Z-score -3 SD to -2 SD), and 37.2% were categorized as severely stunted (Z-score < -3 SD). Severe stunting represents a more critical form of chronic growth failure resulting from inadequate long-term interventions [16].

3.2.2. Association Between Maternal Age at Pregnancy and Stunting Severity

Stunting is a growth and development failure during the First 1,000 Days of Life (1,000 HPK) caused by chronic malnutrition and recurrent infections starting from the prenatal period, characterized by a length- or height-for-age Z-score below -2 SD and a decline in cognitive capacity [17], [18]. Mother's age during pregnancy is proven to influence toddler growth, where pregnancy at a young age leads to nutritional competition between the mother and the fetus, whereas pregnancy at an older age (>35 years) increases the risk of gestational complications that can trigger low birth weight (LBW) and growth and development disorders [19], [20]. In this study, the results showed no statistically significant relationship between mother's age during pregnancy and the incidence of stunting among toddlers aged 6–24 months in the working area of Bagu Health Center, with a p -value of 0.785 ($p > 0.05$). Most cases of stunted (53.5%) and severely stunted (30.2%) status were actually found among mothers pregnant at an ideal age. This finding contrasts with the study by Pusmaika et al. in Tangerang Regency, which demonstrated a significant relationship (p -value = 0.036) [21]. This discrepancy was influenced by the limited sample size ($n = 43$) as well as the use of a cross-sectional design without a control group, which precludes the determination of a causal relationship [22]. Furthermore, the multifactorial nature of stunting means that mothers who become pregnant at an optimal age may still have toddlers who develop stunting, and conversely, pregnancy at a non-optimal age does not necessarily result in stunting [23].

In addition to mother's age at pregnancy, household economic conditions may also influence the occurrence of stunting. In this study, the majority of respondents (88.4%) had a monthly household income below the regional minimum wage. Lower household income may limit access to nutrient-dense foods, resulting in a greater tendency to allocate household food expenditure toward relatively inexpensive carbohydrate-based foods rather than protein-rich food sources [24], [25]. Regarding maternal education, the largest proportion of mothers had completed senior high school (48.8%), followed by those who had completed junior high school (25.6%). Maternal educational attainment may influence

mothers' knowledge and awareness regarding appropriate nutritional practices and childcare, which may subsequently affect the nutritional status and growth of their children [26].

Another prenatal factor was a history of maternal infection during pregnancy, which was reported by 32.6% of the respondents. Maternal infection during pregnancy may interfere with adequate fetal nutrient supply, as infection can alter maternal nutritional requirements and nutrient utilization due to the physiological demands of the maternal immune response [27]. After birth, inadequate nutritional intake during the first 1,000 days of life may lead to metabolic adaptations, including the utilization of body protein as an energy source. Prolonged inadequate nutrient intake may impair bone growth and cellular differentiation, thereby contributing to impaired linear growth and an increased risk of stunting [28]. This condition may be further exacerbated by a history of recurrent infections in children, such as diarrhea and acute respiratory infections (ARI), which may reduce appetite and alter nutrient utilization as nutrients are increasingly required to support the immune response. Recurrent infections may therefore contribute to inadequate nutritional intake and impaired growth [29]. Poor sanitation conditions also increase exposure to pathogens and the risk of recurrent infections, which may further contribute to inadequate nutrient absorption and impaired child growth [30].

4. CONCLUSION

Based on the study conducted in the working area of Bagu Health Center, Central Lombok Regency, it is concluded that there is no statistically significant relationship between mother's age during pregnancy and the severity of stunting among toddlers aged 6–24 months. Respondent characteristics showed that the majority of mothers married at an ideal age (33 individuals) compared to child marriage (10 individuals) or at an excessively older age (1 individual), and male toddlers were more predominant (25 children) than females (18 children). Meanwhile, the total incidence of stunting encompassed 43 toddlers, consisting of 27 toddlers categorized as stunted (62.8%) and 16 toddlers categorized as severely stunted (37.2%).

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