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THE RELATIONSHIP BETWEEN MATERNAL CHARACTERISTICS AND STUNTING INCIDENCE IN NAGARI MUARO SIJUNJUNG DISTRICT WEST SUMATERA PROVINCE IN 2024

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ABSTRACT

This study aimed to determine the relationship between maternal characteristics, namely age, height, and nutritional status during pregnancy, and the incidence of stunting in toddlers in Nagari Muaro, Sijunjung Regency, West Sumatra Province in 2024. The research method used was quantitative with an observational analytic case-control design, involving 50 respondents (31 stunting cases and 19 controls) selected purposively. Data were analyzed using the Chi-Square test with a significance level of 0.05. The results showed a significant association between maternal height (p=0.000) and maternal nutritional status during pregnancy (p=0.000) with the incidence of stunting in toddlers. While maternal age was not significantly associated with stunting (p=0.233). The conclusion of this study is that maternal height and nutritional status during pregnancy play a significant role in the incidence of stunting in toddlers in Nagari Muaro, Sijunjung Regency in 2024.

Keywords: Stunting, Maternal Characteristics, Maternal Height, Maternal Nutritional Status, Pregnancy.

INTRODUCTION

Children, as future assets, require active participation from all parties to invest significantly in various areas to support their optimal growth and development, enabling them to become a superior generation in the future (BPS, 2019b). Children are the nation's next generation and play a crucial role in realizing national development goals. According to information from the Central Statistics Agency (BPS), Indonesian children account for 29.15-31.56% of the total population. During the growth and development of toddlers, nutritional needs are crucial, appropriate for their age. This can be achieved through providing adequate quality and quantity of food, ensuring normal growth and development and preventing infections (BPS, 2018).

The prevalence of stunting nationally based on the Indonesian Nutritional Status Study has decreased, initially from 24.4%, but in 2021 it changed to 21.6% in 2022 (Ministry of Health of the Republic of Indonesia, 2021). The incidence of stunting in West Sumatra Province has increased significantly in 2021, with a prevalence of 23.3% to 25.2% in 2022. This figure can be said to be a setback because it is above the national figure (21.6%), where Sijunjung Regency is the fourth largest contributor to stunting rates, amounting to 30% based on the results of the Indonesian Status Survey (SSGI) by the Research and Development Agency of the Ministry of Health of the Republic of Indonesia in 2022 (Ministry of Health of the Republic of Indonesia, 2022). The high rate of stunting is triggered by various factors. According to the World Health Organization (WHO, 2014), factors that cause stunting in children include nutritional status, exclusive breastfeeding, lack of nutritious food consumption, and infectious diseases. In addition, there are other factors that influence the nutritional status of stunting, namely maternal characteristics (age, education level, occupation, and height). The age of pregnant adolescents can affect growth due to competition for nutrients between the mother and fetus (Stephenson, T., J. & Schiff, W., J. 2019). Mothers with low levels of knowledge and

education and who do not understand nutrition for children and use appropriate child-rearing patterns are at risk of children experiencing stunting. Mothers who work all day cannot provide optimal care for their children because their time is limited, so this can be a cause of stunting in children. A study in North Sumatra indicated that mothers with high education and housewives have the potential to have children who avoid stunting (Lestari, Fujiati, Keumalasari, & Daulay, 2018). The results of an initial survey conducted by researchers found that of the 5 children who experienced stunting, 3 of them had mothers who were 145 cm tall and worked as laborers.

METHODS RESEARCH

This study employed a quantitative approach using an observational analytical case-control design. This design is suited to analyze risk factors retrospectively by comparing a group with the condition (cases) to a group without (controls). The main objective was to identify maternal factors—specifically maternal age, height, and nutritional status during pregnancy—that contribute to stunting in toddlers aged 1 to 3 years. The sample consisted of 50 children, divided into 31 stunted cases and 19 normal controls. Sampling was carried out purposively based on inclusion criteria relevant to the study. Research was conducted in Nagari Muaro Sijunjung, Sijunjung Regency, between May and June 2024. Data collection tools included structured questionnaires administered to mothers or caregivers to obtain relevant maternal and child health information. Primary data collected focused on child health and anthropometric measurements, while secondary data were gathered from maternal health records, specifically the upper arm circumference (LILA) documented in the KIA (Maternal and Child Health) book, which reflects nutritional status during pregnancy.

Data analysis began with univariate methods to describe the distribution and characteristics of variables, followed by bivariate analysis using the Chi Square test to assess the association between maternal factors and stunting, with a confidence interval of 95% and a significance threshold of 0.05. Data processing involved several steps, including data editing to ensure accuracy, coding of responses for statistical analysis, data entry into software, and tabulation of results. Ethical standards were strictly observed throughout the study by securing informed consent from all participants and maintaining the confidentiality of their personal and health information, ensuring the research was conducted with respect and protection for the respondents.

RESEARCH RESULTS AND DISCUSSION

Table 1.
Frequency Distribution by Age in Muaro Village, Sijunjung Regency, 2024

	Frequency	
Age	**F**	**(%)**
At-risk	29	58,0%
Not at-risk	21	42,0%
Total	50	100%

Based on the data presented in Table 1, the distribution of maternal age during pregnancy shows that 29 mothers, or 58.0% of the sample, fall into the category considered “at risk.” This risk classification typically refers to maternal ages that are either below 20 years or above 35 years, which are associated with increased risks for complications during pregnancy and childbirth. In contrast, 21 mothers, accounting for

42.0% of the respondents, are classified as being in the "not at risk" category. These mothers are generally between the ages of 20 and 35 years, which is considered the optimal reproductive age range associated with better pregnancy outcomes and lower risks of complications. The relatively high proportion of mothers in the at-risk age group suggests potential vulnerabilities in maternal health within the study population. Maternal age is a well-documented factor affecting pregnancy outcomes, with younger and older mothers facing challenges such as low birth weight, preterm birth, and higher rates of stunting in children. This data highlights the importance of targeted health interventions and education aimed at mothers in these age groups to reduce risks and improve both maternal and child health outcomes. Understanding the distribution of maternal age risk can help healthcare providers prioritize resources and support for vulnerable groups. Overall, the findings indicate a need for continued monitoring and support for pregnant women at risk due to their age, to help minimize adverse health impacts on both mothers and their infants.

Table 2.
Frequency Distribution by Height in Muaro Village, Sijunjung Regency, 2024

	Frequency	
Height	**F**	**(%)**
At-risk	22	44,0%
Not at-risk	28	56,0%
Total	50	100%

Based on the data presented in Table 4.2, maternal height during pregnancy was categorized into risk and non-risk groups. The data show that 22 mothers, or 44.0% of the sample, fall into the "at risk" category due to shorter maternal height, which is known to be associated with increased risks during pregnancy and childbirth. Conversely, 28 mothers, representing 56.0% of the respondents, are classified as "non-risk" based on their height. These mothers typically have a height above the risk threshold, which is generally considered more favorable for supporting a healthy pregnancy and delivery process. Short maternal height is a recognized risk factor because it can be linked to complications such as obstructed labor, low birth weight, and higher chances of stunting in children.

Therefore, the proportion of mothers in the at-risk height category indicates a notable portion of the population who may need additional care and monitoring during pregnancy. This data underscores the importance of nutritional and health interventions targeting pregnant women with shorter stature to reduce pregnancy-related risks. Health practitioners should be aware of maternal height as a critical factor when assessing prenatal risks and planning appropriate care. In summary, the findings highlight the significance of maternal height as a risk factor in pregnancy, with almost half of the study population falling into the at-risk category, emphasizing the need for tailored health strategies to improve maternal and child health outcomes.

Table 3.
Frequency Distribution by Nutritional Status in Muaro Village, Sijunjung Regency, 2024

Nutritional Status	Frequency	
	F	(%)
Undernourished	15	30,0%
Well-nourished	35	70,0%
Total	50	100%

Based on the data in Table 3 maternal nutritional status during pregnancy was assessed and classified into two categories: undernutrition and well-nourished. The findings indicate that 15 mothers, accounting for 33.0% of the sample, experienced undernutrition during their pregnancy. Meanwhile, a larger proportion of mothers, totaling 35 individuals or 70.0%, were classified as well-nourished. This group generally met the recommended nutritional requirements to support both maternal health and fetal development throughout pregnancy. Maternal undernutrition is a critical concern because it can lead to adverse pregnancy outcomes such as low birth weight, preterm birth, and increased risk of stunting in children. Therefore, identifying and addressing undernutrition among pregnant women is essential for improving infant health outcomes. The relatively high percentage of well-nourished mothers suggests that many women received adequate nutrition, but the presence of a significant undernourished group highlights the need for targeted nutritional interventions and support during pregnancy. In conclusion, the data emphasize the importance of monitoring maternal nutrition as a key factor in preventing pregnancy complications and promoting healthy child growth and development.

Table 4.
Distribution of Stunting Frequency in Muaro Village, Sijunjung Regency, 2024

Stunting	Frequency	
	F	(%)
Stunting	31	62,0%
Normal	19	38,0%
Total	50	100%

Based on the data presented in Table 4.4, the incidence of stunting among the children studied is highlighted. It was found that 31 mothers, representing 62.0% of the sample, had children who experienced stunting. In contrast, 19 mothers, or 38.0% of the sample, had children who exhibited normal growth patterns. This indicates that a significant proportion of the children were affected by growth retardation. Stunting in toddlers is a major public health concern as it reflects chronic malnutrition and can lead to long-term developmental and health challenges. The high prevalence observed suggests underlying factors related to maternal and environmental conditions. The data underscores the importance of identifying and addressing risk factors during pregnancy and early childhood to reduce the occurrence of stunting. Efforts should focus on improving maternal health, nutrition, and child care practices.

Table 5.
Relationship between Maternal Height During Pregnancy and Stunting Incidence in Muaro Village, Sijunjung Regency, 2024

Height	Stunting				Total		p value
	Stunting		Normal				
	F	%	F	%	F	%	
At Risk	22	13,6%	0	8,4%	22	22,0%	0,000
Not at Risk	9	17,4%	19	10,6%	28	28,0%	
Total	31	31	19	19	50	50	

Based on the statistical analysis presented in Table 5, the relationship between maternal height and the incidence of stunting was examined using the chi-square test. The results show a P-value of 0.00, which is less than the significance level of 0.05. This indicates that the findings are statistically significant. Since the P-value is below the threshold, the null hypothesis (Ho), which states that there is no relationship between maternal height and stunting, is rejected. Conversely, the alternative hypothesis (Ha) is accepted, confirming a significant association between these variables. This result suggests that maternal height is a contributing risk factor for stunting among toddlers in Muaro Village, Sijunjung Regency. Mothers with shorter stature are more likely to have children experiencing stunted growth compared to mothers of normal height. Understanding this relationship is crucial for public health interventions, as it emphasizes the importance of maternal health and nutrition even before pregnancy. Addressing maternal height as a risk factor can help reduce stunting rates in the community.

Table 6.
Relationship between Maternal Nutritional Status during Pregnancy and the Incidence of Stunting in Muaro Village, Sijunjung Regency, 2024

Nutritional Status	Stunting				Total		p value
	Stunting		Normal				
	F	%	F	%	F	%	
Gizi K Undernourished	15	9,3%	0	5,7%	15	15,0%	0,000
Gizi BaWell-Nutritioned	16	21,7%	19	13,3%	35	35,0%	
Total	31	31	19	19	50	50	

Table 6 presents the results of the chi-square test analyzing the relationship between maternal nutritional status and the incidence of stunting in Muaro Village, Sijunjung Regency. The test produced a P-value of 0.000, which is below the standard significance level of 0.05. This indicates that the result is statistically significant. Because the P-value is less than 0.05, the null hypothesis (Ho), which claims there is no relationship between maternal nutritional status and stunting, is rejected. On the other hand, the alternative hypothesis (Ha) is accepted, confirming that a significant association exists between these variables. This finding implies that maternal nutritional status during pregnancy plays an important role in influencing the risk of stunting among toddlers in the area. Mothers who experience undernutrition during pregnancy are more likely to have children who suffer from stunted growth. Recognizing this relationship highlights the need for focused health programs to improve maternal nutrition, which can subsequently reduce stunting rates. Improving

maternal nutrition before and during pregnancy is crucial to ensuring better growth and development outcomes for children.

Table 7.
Relationship between Maternal Age during Pregnancy and Stunting Incidence in Muaro Village, Sijunjung Regency, 2024

Age	Stunting				Total		p value
	Stunting		Normal				
	F	%	F	%	F	%	
At Risk	20	18,0%	9	11,0%	29	29,0%	0,233
Not at Risk	11	13,0%	10	8,0%	21	21,0%	
Total	31	31	19	19	50	50	

Table 7 displays the results of the chi-square test examining the relationship between maternal age and the incidence of stunting in Muaro Village, Sijunjung Regency. The statistical analysis yielded a P-value of 0.233, which is greater than the significance threshold of 0.05. Because the P-value exceeds 0.05, the null hypothesis (Ho), which states there is no relationship between maternal age and stunting incidence, is accepted. Conversely, the alternative hypothesis (Ha), which suggests a relationship, is rejected. This means the data do not support a significant association between these variables. This result indicates that maternal age during pregnancy does not have a statistically significant impact on the likelihood of children experiencing stunted growth in the study area. Maternal age, whether categorized as at risk or not, appears unrelated to stunting incidence among toddlers in Muaro Village. These findings suggest that interventions focusing solely on maternal age may not be effective in reducing stunting rates. Instead, attention should be directed toward other factors that have shown significant associations with stunting, such as maternal height and nutritional status.

The relationship between height and stunting

Based on the statistical analysis using the chi-square test, the P-value obtained was 0.00, which is less than the significance level of 0.05. This result led to the acceptance of the alternative hypothesis (Ha), indicating a significant relationship between maternal height and the incidence of stunting in children. In other words, the study confirmed that maternal height is an important factor influencing whether a child experiences stunted growth. The findings suggest that mothers with shorter stature have a higher risk of giving birth to stunted children, while mothers with ideal or taller heights tend to have children with normal growth and development. This relationship highlights the potential impact of maternal physical factors on the nutritional and growth status of toddlers. This correlation can be explained by the fact that shorter maternal height often reflects a history of poor nutrition or health challenges, which may affect fetal growth and subsequently the child's development after birth. Children born to mothers of adequate height are more likely to receive better intrauterine growth conditions, reducing the risk of stunting. Supporting this study, Wahdah stated that parental height is strongly associated with the incidence of stunting in children. This aligns with broader research suggesting that parental physical characteristics, especially maternal height, can serve as predictors of a child's nutritional status.

The Relationship Between Nutritional Status and Stunting

Based on the chi-square statistical test, the P-value obtained was 0.000, which is less than the significance level of 0.05. This result leads to the acceptance of the alternative hypothesis (Ha) and rejection of the null hypothesis (Ho), indicating a significant relationship between maternal nutritional status during pregnancy and the incidence of stunting in children. This finding highlights the important role maternal nutrition plays in influencing child growth outcomes. The study shows that mothers who experienced undernutrition during pregnancy are more likely to have children who suffer from stunting. Poor maternal nutrition can affect fetal development, leading to low birth weight and impaired growth, which increase the risk of stunting in toddlers. On the other hand, well-nourished mothers tend to give birth to children with better growth and development prospects. Malnutrition during pregnancy can result in insufficient nutrient supply to the fetus, affecting essential growth processes. This condition may contribute to delays in physical and cognitive development in children, which are characteristic features of stunting. The nutritional status of mothers is therefore a critical factor that needs to be addressed to prevent stunting. Supporting this finding, Par'I (2017) emphasized that nutritional problems in toddlers have long-term consequences on their future lives. Malnutrition is a serious health issue because it can cause irreversible developmental delays, impacting not only physical growth but also mental and social capabilities. Thus, improving maternal nutrition is key to breaking the cycle of stunting and promoting healthier generations.

The Relationship Between Age and Stunting

Based on the Chi-Square Test, the P-value was 0.233, thus accepting Ho and rejecting Ha, indicating no relationship between maternal age and stunting. This study's findings contrast with a 2022 study by Rangga Pusmaika, "The Relationship Between Maternal Age During Pregnancy and Stunting in Toddlers in Tangerang Regency," which showed a relationship between maternal age during pregnancy and stunting (p-0.036). Stunting remains a major nutritional problem in Indonesia, affecting children under five years of age. Several factors contribute to stunting, including direct causes (child characteristics, infectious diseases, and inadequate dietary intake) and indirect factors, such as maternal characteristics (very young gestational age, low height, education level, limited understanding, and employment patterns that impact family income and food availability at home) (Ministry of Health, 2018).

CONCLUSION

After conducting the research, the authors concluded that the study, entitled "The Relationship between Maternal Characteristics and Stunting Incidence in Muaro Village, Sijunjung Regency in 2024," concluded:

1) From the research results, 29 mothers (58.0%) were at risk of maternal age during pregnancy, while 21 (42.0%) were not at risk. 22 mothers (44.0%) were at risk of maternal height during pregnancy, while 28 (56.0%) were not at risk. 15 mothers (33.0%) were malnourished during pregnancy, 35 (70.0%) were well-nourished. 31 children (62.0%) were stunted, and 19 (38.0%) were normal.
2) Statistical testing using the chi-square test yielded a P-value of 0.00 <0.05, thus Ha is accepted and Ho is rejected. This indicates a relationship between maternal height and stunting in Muaro Village, Sijunjung Regency in 2024.

3) The chi-square test yielded a P-value of 0.000 <0.05, thus Ha is accepted and Ho is rejected. This indicates a relationship between maternal nutritional status and stunting in Muaro Village, Sijunjung Regency in 2024.
4) Statistical testing using the chi-square test yielded a P-value of 0.233, thus Ho is accepted and Ha is rejected. This indicates no relationship between maternal age and stunting.

REFERENCES

Badan Pusat Statistik (BPS). (2018). Status Gizi Anak Indonesia 2018. Badan Pusat Statistik, Indonesia.

Badan Pusat Statistik (BPS). (2019b). Jumlah Anak Indonesia Menurut Wilayah dan Persentase terhadap Total Penduduk. Badan Pusat Statistik, Indonesia.

Kementerian Kesehatan Republik Indonesia. (2021). Hasil Studi Status Gizi Indonesia 2021. Kementerian Kesehatan RI.

Kementerian Kesehatan Republik Indonesia. (2022). Hasil Survei Status Gizi Indonesia (SSGI) 2022. Kementerian Kesehatan RI.

Par'I. (2017). Dampak Masalah Gizi pada Balita terhadap Kehidupan Masa Depan.

Rangga Pusmaika. (2022). Hubungan Usia Ibu saat Hamil dengan Stunting pada Balita di Kabupaten Tangerang.

Stephenson, T. J., & Schiff, W. J. (2019). Pengaruh Usia Ibu Hamil terhadap Pertumbuhan Janin dan Risiko Stunting.

Lestari, F., Fujiati, S., Keumalasari, R., & Daulay, D. (2018). Hubungan Tingkat Pendidikan Ibu dan Pekerjaan dengan Kejadian Stunting pada Anak di Sumatera Utara.

World Health Organization (WHO). (2014). Childhood Stunting: Risk Factors and Prevention. WHO Publications.