

The Relationship Between Early Pregnancy, Birth Distance, and Resident Status with Stunting Incidence in Elementary School Children in Enrekang Rural

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Abstract

Stunting is a global health emergency, including in Indonesia. The cause of multisectoral stunting, the preparation of a woman as a prospective mother contributes greatly to the quality of health for the next generation. This study aims to determine the relationship between maternal age at first pregnancy, birth spacing, and residence status with the incidence of stunting in elementary school children in rural Enrekang. A community-based cross-sectional study was conducted in 3 villages in Enrekang Regency from July to August 2021. This study involved 100 elementary school children who were selected by purposive sampling. Data was collected using a validated structured questionnaire and microtoa. The statistical test used is the Chi-square test. From a total of 100 children as respondents, 72.0% were found to be stunted and 28.0% were found to be normal. The age of the mother during pregnancy is considered ideal at 62.0%, the ideal birth spacing for children is 84.0%, and the status of residence with own ownership is 67.0%. The results showed that there was no significant relationship between the mother's age at first pregnancy ($p=0.693$) and birth spacing ($p=0.373$) and the incidence of stunting. Meanwhile, the status of residence is considered related to the incidence of stunting in elementary school children with a value of $p = 0.014$. Maternal age at first pregnancy and birth spacing were not related to stunting.

Keywords: Drug Side Effects (ESO), Post-Covid-19, Vaccination

Key Messages:

- The preparation of a woman as a prospective mother contributes greatly to the quality of health for the next generation.
- It is very important for women as prospective mothers to pay attention to the age at which they first became pregnant and the spacing of their children's births.

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1. Introduction

Malnutrition is a condition caused by a diet that lacks nutrients (undernutrition) or too many nutrients (overnutrition), causing health problems (1). Malnutrition among children is a major public health emergency and is one of the most common causes of morbidity and mortality worldwide (2). Stunting is a form of malnutrition (1). According to the World Health Organization (WHO), children are defined as stunted if the results of their height-for-age measurements are below <-2 standard deviations (SD) and severe stunting if they are at <-3 SD (3).

WHO in 2021 reported that 149.2 million (22%) of children under five were stunting, and 54% lived in Asia (4). The prevalence of stunting in Southeast Asia reaches 33.8%, and Indonesia ranks fifth with the highest number of stunting among 81 countries in the world (5). Indonesia has recorded a relatively high prevalence of stunting. The information recorded in the 2013, 2018 Indonesian Basic Health Research, and the 2019 and 2020 Indonesian Toddler Nutrition Status Survey (SSGBI) with 37.8%, 30.8%, 27.6%, and 24.4% respectively (6) (7) (8). Although this number fluctuates and tends to decrease, the prevalence is still considered high based on the WHO determination of $>20\%$ (9). South Sulawesi, based on the 2019 SSGBI report, shows a prevalence of under-five stunting of 30.1%, the highest was in Enrekang Regency at 44.8% (7). The highest was in Buntu Batu District with an average of over 40% (Enrekang Regency Service e-PPBGM 2020). There have been many studies showing the adverse effects of stunting which are divided into 2, namely the short term including increased morbidity and mortality, low cognitive, motor, and language development, and economics such as the cost of illness. While the long term such as stunting, increased obesity as adults and non-communicable disease (NCD), decreased reproductive health, poor performance, decreased learning capacity, decreased work capacity and work productivity (10) (11) (12). These will all affect all aspects of children's lives, the effect is not only limited to physical well-being but reaches mental, social, and spiritual well-being (13). All of these contribute to 21% of the life span associated with disabilities in children, especially stunting which is responsible for a loss of 2–3% of the country's gross domestic product (GDP) (14).

The Indonesian government aims to reduce stunting by 14% by 2024 based on the National Medium-Term Development Plan (RPJMN). Research on stunting has been promoted in recent years. The incidence of stunting in children is considered multisectoral. Parenting, eating patterns, education, social, economic, family size, infectious diseases, and sanitation are a risk for stunting (15) (16) (17) (1). But not limited to that, the incidence of stunting is also rooted in a woman's readiness to become a mother including paying attention to the age at first pregnancy and the spacing of her children's births so that this research will look at the relationship between early pregnancies, spacing of children and residence status with the incidence of stunting in school children based in Enrekang countryside.

2. Methods

2.1 Research Design, Location, and Time

An observational analytic study with a research design cross-sectional school-based. In this study, the independent and dependent variables were taken at the same time by observing the relationship between the independent variables (age of the mother at first pregnancy, spacing of children's births, and residence status) to the dependent variable. (stunting). This study was conducted in 3 Lokus villages with incidents stunting the highest, namely Buntu Mondong Village, Potokullin Village, and Latimojong Village, Buntu Batu District, Enrekang Regency, South Sulawesi Province from July to August 2021. The selection of these 3 villages was based on the 2020 Enrekang District Health Office EPPBGM data report. each village is far apart and located at the top of the mountain, the belly of the mountain, and the foot of the mountain. About 60 kilometers from the district center.

2.2 Population and Sample Size

The population in question is all students who are still pursuing basic education (elementary school) in 3 Lokus Villages, near Buntu Mondong Village, Potokullin Village, and Latimojong Village. The Lemeshow et al (1997) formula determined the sample size: $n = \frac{z^2 \cdot 1 - \alpha / 2P(1-P)}{d^2}$. And obtained "n" is 96, so researchers at least take data from a sample of at least 96 people.

2.3 Sampling Technique

Use purposive sampling by establishing inclusion and exclusion criteria. The inclusion criteria in question were that the mother and child were indigenous people, willing to take part in the study, the respondent lived at the same house, the children had no anatomical abnormalities, and were aged between 6-12 years. While the exclusion

criteria were mothers and children who were only migrants and lived only a few weeks, refused to be respondents, and were over 12 years of age.

2.4 Data Collection and Quality Control

Data collection was carried out using a structured questionnaire that had been tested for validation and microtoa. Height measurements were carried out by the research team using a microtoa. Determination of the child's height with an accuracy of 0.1 cm. To avoid bias, it is very important to discipline the research team to always pay attention to the Standard Operating Procedures (SOP) for anthropometric measurements. The child's age is calculated in full years or full months. The family card is asked to be a reference in determining the age and filling in the child's identity. The results of the height measurement were then processed to obtain the child's nutritional status using the WHO Anthro-Plus software, namely the Height/Age Z-score index.

The age of the mother at first pregnancy can be calculated based on the information in the Maternal and Child Health (MCH) book, a doctor's, nurse's or midwife's certificate. Mothers are said to get pregnant quickly if they are <20 years old and are said to be normal if they are ≥20 years old. The spacing of children's births is determined based on the difference in the year each child was born as evidenced by the date, month and year of birth on the Family Card (FK). Birth spacing is said to be fast if it is <2 years and normal if it is ≥2 years. And the status of the residence is determined based on the respondent's statement, whether it is owned or rented.

2.5 Analysis of Data

Data processing is done by using a computerized program Statistical Package for Social Science (SPSS) version 24. The statistical test used is the Chi-square test with a significance level of $\alpha = 0.05$.

2.6 Ethical Clearance

Health Research Ethics Commission, Faculty of Public Health, Hasanuddin University on October 14 with number: 9190/UN4.14.1/TP.01.02/2021

3. Results

Table 1 shows that the characteristics of mothers based on age are most commonly found in the age group 31-40 years, namely 45 people (45.0%). Most recent education was found in elementary school graduates, namely 34 people (34.0%). The majority of mothers are housewives (not working) with a total of 53 people (53.0%). Mothers with 3 children were the most found, namely 30 people (30.0%). The average age of the mother when she first conceived was over 20 years, namely 62 people (62.0%). The most birth spacing of children is over 2 years, namely 84 children (84.0%). Finally, the majority of mothers occupy their own homes, namely 67 people (67.0%).

Table 1 Characteristics of Mothers of Elementary School Children

Characteristics of Mother	n	%
Age (Years)		
21 – 30	17	17,0
31 – 40	45	45,0
41 – 50	33	33,0
51 – 60	5	5,0
Education		
Not completed in primary school	5	5,0
Graduated from elementary school	34	34,0
Middle school graduate	27	27,0
Graduated from high school	18	18,0
College Graduate	16	16,0
Work		
Housewife	53	53,0
Gardener/Farmer	27	27,0

Characteristics of Mother	n	%
Traders/Sellers	4	4,0
Daily Labor	2	2,0
Craftsmen	1	1,0
Private Officer	2	2,0
State Civil Apparatus	9	9,0
Other	2	2,0
Number of children		
1 – 2 children	23	23,0
3 – 4 children	52	52,0
5 – 6 children	19	19,0
7 – 10 children	6	6,0
Age at First Pregnancy (Years)		
15 – 19	38	38,0
> 20	62	62,0
Spacing of Child Birth		
≤ 2 years	16	16,0
≥ 2 years	84	84,0
Status of residence		
One's own	67	67,0
Rent	33	33,0
Total	100	100,0

Source: Primary Data, 2021 (*Univariate Test, Crosstabulation*)

Table 2 shows that of the 100 children who were respondents, most were 10 years old, namely 31 children (31.0%), half of them were boys, namely 51 children (51.0%) and the majority were in nutritional status. stunting, namely as many as 72 people (72.0%).

Table 2 Characteristics of Elementary Children

Child Characteristics	n	%
Age (Years)		
7	11	11,0
8	15	15,0
9	26	26,0
10	31	31,0
11	15	15,0
12	2	2,0
Gender		
Man	51	51,0
Woman	49	49,0
Children's Nutritional Status		
Stunting	72	72,0
Normal	28	28,0
Total	100	100,0

Source: Primary Data, 2021 (*Univariate Test, Crosstabulation*)

Table 3 on the variable mother's age at first pregnancy shows the $p=0.693$ until H_0 accepted and it was concluded that there was no significant relationship between the age of the mother at first pregnancy and the incidence of stunting. The findings are corroborated by the univariate test that the age of the mother at first pregnancy is considered ideal but tends to give birth to stunted children (74,2%). As for the distance between the birth of the child and the $p= 0.373$, it shows that there is no relationship between childbirth spacing and the incidence of stunting. Mothers with ideal birth spacing tend to give birth to stunted children (73,8%). While the status of residence with $p=0.014$ indicates H_a accepted which means there is a relationship between residence status and the incidence of stunting. The majority of mothers live in their own homes but tend to give birth to stunted children (54.5%).

Table 3 Relationship Between Variables

Variable	Nutritional status				Total		p
	Stunting		Normal		n	%	
	n	%	n	%			
Mother's Age at First Pregnancy							
Fast	26	68,5	12	31,5	38	100,0	0,693*
Ideal	46	74,2	16	25,8	62	100,0	
Spacing of Child Birth							
Fast	10	62,5	6	37,5	16	100,0	0,373**
Ideal	62	73,8	22	26,2	84	100,0	
Status of residence							
One's own	54	80,6	13	19,4	67	100,0	0,014*
Rent	18	54,5	15	45,5	33	100,0	
Total	72	72,0	28	28,0	100	100,0	

Source: Primary Data, 2021 (*Chi-square test*)

Description: * *Continuity Correction*. ** *Fisher's Exact Test*

4. Discussion

The results of the study showed that out of 100 children who were sampled, 72 children (72.0%) obtained stunting while children with normal height were 28 children (28.0%). It can be concluded that the majority of children with nutritional status stunting. Stunting is a form of the child's growth process which is stunted or the child's height does not match his age. This is caused by a deficiency of optimal nutrients for a long time (18). Linear growth failure in stunted children is associated with various consequences of irreversible health problems (19). Enrekang Regency, which is the research location, is rated with the best Human Development Index (HDI) in South Sulawesi in 2020, but this is inversely proportional to the highest stunting presentation in all Cities/Districts in South Sulawesi Province. Government policy to reduce the prevalence of stunting is a Sustainable Development Goals (SDGs). The goals are no poverty, no hunger, achieve food security and improve nutrition, and launch sustainable agriculture. This situation follows Indonesia's 2020–2024 RPJMN (National Medium Term Development Plan) policy which raises one of the points related to stunting, namely accelerating the reduction of stunting by increasing the effectiveness of specific and sensitive nutrition interventions. The South Sulawesi government has implemented various government programs in tackling stunting. All cross-sectors are involved, including scientific experts, government, academics, practitioners, and all relevant stakeholders. Leaders' commitment is needed in repairing serious problems in society. Indicators of success can be seen from the better condition of the children so that they become a generation of quality and are ready to compete at the global level.

Relationship Between Mother's Age at First Pregnancy and Stunting

The results showed that there was no significant relationship between the age of the mother at first pregnancy and the incidence of stunting ($p=0.693$). We found that the majority of pregnant women were at the

ideal age (≥ 20 years) but tended to give birth to stunted children, which was 46.0% compared to those who were early. Even though the village where we researched is remote, early marriage is not very strong in this area. We found only about 30% of the total respondent's early marriage. Perceptions like this need to be maintained and education should be encouraged on health and early marriage in remote villages. Of course, this needs cooperation with the local government so that people's statements condense like this. This finding is in line with the study of Wati et al (2022) in Banyumas Regency, Central Java which showed no relationship between maternal age and the incidence of stunting (5).

In theory, Prendergast and Humphrey (2014) suggest that pregnant women in their teens are still in their infancy so there can be struggles for nutrients between the fetus and the mother's metabolism. This situation will get worse if the mother's nutritional intake is inadequate so that the fetus will experience growth retardation thereby increasing the risk of the fetus being born with low birth weight or premature birth where both of these are factors in the occurrence of stunting in children (20). We did not find a significant relationship between maternal age at first pregnancy and stunting. We suspect that other factors are causing the high prevalence of stunting in Enrekang villages, one of which is the mother's knowledge. In the same study in the Enrekang village, we found a significant relationship between mothers' knowledge and the incidence of stunting in children (21). The mother is the main caretaker of the child with the main goal being to avoid nutritional problems. Mothers who have good nutritional knowledge are expected to be able to provide the right type and amount of food so that children can grow and develop optimally (22). Therefore, mothers have a major role in determining the variety of food and identifying the nutritional needs of their family members, especially children. Knowledge is the initial capital of a mother which is used to provide adequate care for her children. Lack of mother's knowledge is one of the causes of stunting (21).

The results of our study are inversely proportional to other studies, including research by Sani et al (2020) which states that there is a significant relationship between maternal age during pregnancy and the incidence of stunting (23). Furthermore, the study by Simbolon et al (2021) shows the same thing that the prevalence of stunting is higher in toddlers from mothers who are pregnant in their teens (44.4%) compared to mothers who are pregnant at the ideal age (35.6%) (24). Many factors cause the problem of stunting in toddlers, one of which is the mother's factor. Age during pregnancy is a maternal factor that can be a direct and indirect problem for the growth and development of the fetus and toddler (24). The younger the mother at the time of marriage and pregnancy, the greater the risk of having a child with severe stunting (9).

The Relationship Between Childbirth Spacing and Stunting

The birth interval is the length of time between the birth of a child and the birth of the previous and/or subsequent siblings. The results showed that there was no relationship between birth spacing and the incidence of stunting with a value of $p = 0.373$. This finding was corroborated by the univariate results, where the majority of children's birth spacing was in the ideal category and tended to be stunted, namely 62.0%, while the fast birth spacing was only 10.0%, which found stunting. Fast and ideal birth spacing for half of the total stunted children, although most are found at ideal birth spacing. We found that the birth spacing of children varied and most were above 3 years. The spacing of children born too close will affect their nutritional status due to less optimal parenting by the mother. In addition, birth spacing of fewer than two years can cause poor fetal growth, prolonged labor, and bleeding during delivery because the uterus has not recovered properly, thereby increasing the risk of anemia in the mother during pregnancy which has an impact on the risk of stunting (25). Meanwhile, long birth intervals affect maternal productivity, child health, and nutrition (26). Furthermore, maternal nutritional factors before and during pregnancy are very important for the growth and development of the baby (5).

Spacing of childbirths is considered not to be a risk factor for stunting in Enrekang villages. However, stunting can be caused by several factors, one of which is the mother's parenting factor. We suspect that parenting contributes to stunting. Parents play an important role in shaping children's eating behavior through parenting and eating patterns (27). Our previous study found a significant relationship between children's diet and the incidence of stunting in Enrekang villages ($p=0.049$) (28). This finding is in line with a study in Banyumas that found a significant relationship between maternal parenting and stunting (5). Children's health depends on the right parenting style of the mother in choosing food ingredients, food processing, preparing nutritious food, controlling children's food patterns, and maintaining children's hygiene. The mother's role is very large in making

decisions on the household consumption menu, especially to meet the nutritional needs of all family members. This research is in line with the literature review study by Beal et al (2018) which stated that there is no relationship between short birth spacing and the incidence of stunting in Indonesian children (15). This research is also supported by the study of Wati et al (2022) in Banyumas Regency, Central Java, which shows that there is no significant relationship between birth spacing and the incidence of stunting (5). However, this study is inversely proportional to research in India which found a significant relationship between birth spacing and stunting. Children born <24 months apart tend to experience stunting (29). This finding is in line with a study in the province of East Nusa Tenggara, Indonesia, which showed that birth spacing is significantly correlated with stunting (25).

Relationship Between Residence Status and Stunting Incidents.

The status of residence referred to in this study is the property right of the family residence, whether it is owned or not owned or rented. We see that the majority of families live in houses with self-ownership status. The results showed that there was a significant relationship between residence status and the incidence of stunting ($p=0.014$). We observed that almost all of the response houses were stilt houses, many of which had latrines, and some were found to have inadequate ventilation. However, the sewerage channels are left open in the neighborhood of residents' homes and are connected from one house to another. We suspect that if the respondent's house ownership is not supported by adequate environmental hygiene and sanitation, it will cause stunting in children. This becomes a transformation of the growth and development of bacteria and viruses that can cause health problems. The same study in the Enrekang village found a significant relationship between infectious diseases and stunting (30). Even though the child lives, grows, and develops in his own home, if it is not based on healthy and clean housing conditions (hygiene sanitation), then there is a vulnerability to nutritional problems. Safe disposal of feces and waste is very important to prevent the emergence of diseases caused by bacteria that cause infectious diseases such as diarrhea and fecal-induced pneumonia (31).

Then, we suspect that the ventilation conditions in the house affect the stunting problem. Of the hundreds of houses we visited, it was found that several houses lacked adequate ventilation. A study suggests that home ventilation is a significant factor associated with pneumonia in toddlers. Lack of lighting and room temperature, type of wall protection, and ceiling are also sanitation factors associated with an increased risk of respiratory tract infections, we found that some children had ARI (31). Stunting will decrease based on the health of the household environment. Housing health requirements cover three aspects of the assessment, namely the housing component group, the sanitation facility group, and the owner's behavior group. In general, the three assessment groups were inadequate to support stunting prevention (25)..

5. Conclusion

There is no significant relationship between the age of the mother at first pregnancy and the spacing between births and the incidence of stunting. The status of residence is considered to be significantly related. Although the age of the mother at first pregnancy and the spacing of children born have no relationship with the incidence of stunting, we suspect that parenting styles, attitudes, sanitation hygiene, environmental cleanliness, house cleanliness, and water sources contribute to the incidence of stunting. Residence status is considered to be significantly related to the incidence of stunting. We observe the condition of the house, the cleanliness of the house, and the adequacy of ventilation affect the incidence of stunting in elementary school children.

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