



Sociodemographic Factors Toward Stunting: A Community-Based Cross-Sectional Study

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ABSTRACT

Stunting is a malnutrition problem that occurs globally and has long-term impacts on both health and cognition. There have been no studies related to sociodemographic factors towards stunting in one of the areas with the most stunting rates Gorontalo. This study aims to provide an overview of the prevalence of stunting and associated factors. This research method is descriptive with a cross-sectional approach in 325 children aged 6-59 months, in 8 villages in Tilango District, Gorontalo Regency. Mothers who met the criteria parents and children aged 6-59 months, and children who live in the Tilango District area of Gorontalo Regency, are willing to be the subject of research and came to the Integrated Service Post (Posyandu) sequentially (consecutive sampling) were given a questionnaire. The prevalence of stunting is 116 (35.7%). Birth Length (OR=3.65; 95% CI: 2.261-5.88), Birth Weight (OR:7.3; 95% CI: 3.774-14.238), Exclusive Breastfeeding (OR=3.586; 95% CI: 2.217-5.799, and Complementary Foods (OR=3.586; 95% CI: 2.217-5.799) associating against stunting. The study concluded that the prevalence of stunting in the Tilango District area is still very high, but only four of the 12 sociodemographic factors studied are associated with stunting. Nutritional status screening, monitoring of weight gain during pregnancy, as well as regular ANC examinations are important for Midwives and pregnant women at every contact, especially in first-level health facilities.

Keywords: Stunting, Birth Length, Birth Weight, Exclusive Breastfeeding, Complementary Food

INTRODUCTION

Stunting, defined as impaired growth and development due to poor nutrition and other factors, remains a significant public health problem globally. Stunting is defined as a condition where a child's height-for-age is below two standard deviations from the median height-for-age of a reference population, indicating chronic malnutrition (de Onis & Branca, 2016). In 2019, an estimated 144 million children under the age of 5 years were stunted worldwide, with the highest prevalence in sub-Saharan Africa and South Asia (de Onis & Branca, 2016; UNICEF, 2021). According to the World Health Organization, stunting affects an estimated 149 million children under the age of five globally, indicating a significant public health problem (World Health Organization, 2020). Although the prevalence of stunting has declined over the past two decades, progress has been slow, and stunting remains a major public health concern, particularly in low- and middle-income countries. (Scott et al., 2020; Victora et al., 2021)

Indonesia, one of the low- and middle-income countries has a problem with stunting as well. Stunting is a significant public health concern. According to the 2018 Basic Health Survey, the prevalence of stunting in Indonesia was 27.67%, which means that

approximately one in every four children under five years old in Indonesia is stunted. This issue is of particular concern in rural areas, where the prevalence of stunting can reach up to 35.6% (Badan Penelitian dan Pengembangan Kesehatan, 2018). Several sociodemographic factors have been associated with stunting in Indonesia. (Badriyah & Syafiq, 2017; Beal et al., 2018; Wicaksono & Harsanti, 2020)

Recent research has highlighted the critical role of parental sociodemographic factors, such as education, income, and occupation, in determining the risk of stunting in children under the age of five. However, the specific pathways through which these factors influence stunting and the extent to which they vary across different populations are still not fully understood (Bommer et al., 2019; Laksono et al., 2022; Wali et al., 2021). Other research has shown the complex interplay of these factors and the need for tailored interventions to address stunting in different populations (Scott et al., 2020; Wicaksono & Harsanti, 2020). Additionally, effective interventions to address sociodemographic factors and stunting require a multisectoral approach involving parental height, nutrition, education, and poverty reduction. (Hoddinott et al., 2013; Wu et al., 2021)

While there have been some previous studies on the relationship

between sociodemographic factors and stunting, this study contributes to the literature by focusing specifically on the Indonesian context and examining a range of sociodemographic factors, including parental education, income, and occupation. By examining these factors in combination, we can better understand their complex relationships and develop more nuanced and effective strategies for addressing stunting in Indonesian children. The research objective of this study is to examine the relationship between sociodemographic factors and stunting in children in Gorontalo, Indonesia, with the aim of identifying the key risk factors associated with stunting and developing targeted interventions to reduce its prevalence.

METHOD

This descriptive-analytic study with a cross-sectional approach was conducted in Tilango District, Gorontalo Regency. This research has passed the ethical review of the Research Ethics Commission of the Health Polytechnic of the Ministry of Health Gorontalo (No. LB. 01.01/KEPK/126/2022) on April 06, 2022, and obtained approval from the relevant agencies (PPM Health Polytechnic of the Ministry of Health Gorontalo, National Unity and Political Agency, and Tilango District, Gorontalo Regency) as well as

informed consent from each research subject.

The target population of this study was all mothers who had children aged 6-59 months in the Tilango District area. The sampling technique was consecutive, that is, every mother who came to the integrated service post (Posyandu) in 8 villages in the Tilango sub-district area sequentially in the period July to November 2022 and had met the inclusion and exclusion criteria, was included as a research subject.

The sample size is calculated based on the goal by using the population proportion formula by considering several things as follows:

The proportion of toddlers with stunting (12.4%)

The absolute desired degree of precision, d (5%)

Meaningfulness rate, $Z\alpha$ 95% (1.96)

The sample size above has met the minimum sample size according to the sample size calculated using the rule of thumb formula, which is 5-50 times, the most recommended is 10 times the number of free variables studied.

The inclusion criteria for this study are parents and children aged 6-59 months and children who live in the Tilango District area of Gorontalo Regency and are willing to be the subject of research. Pregnant women who have Gemelli children and

have children born with congenital abnormalities are the criteria for exclusion from the study. A total of 325 were samples/ subjects of this study.

The research questionnaire was in the form of 12 sociodemographic questions of parents and children. The data collection was assisted by enumerators, namely 8 midwives and 8 cadres from 8 villages in Tilango District who had previously received briefings and similarities in the perception of questionnaire question items with researchers. Researchers only provide hardcopy questionnaires as a data

collection tool because community conditions are not supported if they use electronic media. The collected data are analyzed univariately in the form of frequency and percentage tables, and bivariate to see the association between factors to stunting using Chi-Square.

RESULTS AND DISCUSSIONS

Results

Concluding stunting and normal obtained from the results of the questionnaire answers, the result is seen in Table.1 and Table.2:

Table. 1 Prevalence of Stunting in Tilango District, Gorontalo Regency, 2022

No	Height	n	Percentage (%)
1	Normal	209	64,3
2	Stunting	116	35,7
	Total	325	100

Source: *primary data*

Based on Table.1 the results of data collection from 325 subjects found that 116 (35.7%) were stunted. This result is to the results shown (Popkin et al., 2020) that LMIC countries have a stunting prevalence of > 30%, but lower than other parts of Indonesia which reached 44%. (Hastuti et al., 2020)

Various sociodemographic factors related to the incidence of stunting in the Tilango Health Center Work Area, from 325 mother-toddler couples who had

children aged 6-59 months who were involved as respondents during the study were described based on the results of bivariable analysis of each independent variable studied, namely sociodemographic variables (baby's length, baby weight, gender, mother's age, mother's and father's education, family income, maternal height, ANC, maternal nutritional status, parity, exclusive breastfeeding, and complementary food time) can be seen in the Table.2.

Table 2. Association of Sociodemographic Factors with Stunting Incidence in Tilango Kabupaten Gorontalo District

Variable	Height		Total n (%)	p	PR (95% CI)
	Normal n (%)	Stunting N (%)			
Birth Length					
Normal (≥ 48)	152 (75,6)	49 (24,4)	201	0,000	3,65 (2,261-5,88)
Short (<48)	57 (46)	67 (54)	124		
Birth Weight					
Normal (≥2500)	195 (72)	76 (28)	271	0,000	7,3 (3,774-14,238)
Low (<2500)	14 (25,9)	40 (74,1)	54		
Mother Age					
Normal (20-35)	154 (63,1)	89 (36,9)	243	0,636	0,81 (0,456-1,562)
Risky (<20/>35)	56 (68,3)	26 (31,7)	82		
Mother's Education					
College	27 (81,8)	6 (18,2)	33	0,163	1,0
Senior High School	75 (66,4)	38 (33,6)	113		2,23 (0,867-5,996)
Junior High School	39 (57,4)	29 (42,6)	68		3,35 (1,223-9,157)
Elementary School	47 (61,8)	29 (38,2)	76		2,78 (1,023-7,535)
Did not finish Elementary School	21 (60)	14 (40)	35		3,00 (0,985-9,135)
Father's Education					
College	17 (77,3)	5 (22,7)	22	0,7	1,0
Senior High School	71 (70,3)	30 (29,7)	101		0,37 (0,119-1,157)
Junior High School	21 (50)	21 (50)	42		0,53 (0,266-1,066)
Elementary School	71 (65,7)	37 (34,3)	108		1,26 (0,558-2,850)
Did not finish Elementary School	29 (55,8)	23 (44,2)	52		0,657 (0,334-1,292)
Income					
Minumum Wage (≥ Rp 2.384.020)	60 (69,8)	26 (30,2)	86	0,218	1,394 (0,821-2,367)
< Minimum Wage (< 2.384.020)	149 (62,3)	90 (37,7)	239		
Mother's Height					
Enough (>150)	124 (68,1)	58 (31,9)	182	0,105	1,459 (0,924-2,303)
Short (<150)	85 (59,4)	58 (40,6)	143		
Antenatal care					
Enough (≥ 6)	162 (66,4)	82 (33,6)	244	0,173	1,429 (0,854-2,392)
Insufficient (<6)	47 (58)	34 (42)	81		
Arm Circumference					
Normal (≥ 23,5)	156 (65,8)	81 (34,2)	237	0,349	1,272 (0,768-2,106)
Chronic Lack of Energy (<23,5)	53 (60,2)	35 (39,8)	88		
Breastfeeding					
EBF	131 (78)	37 (22)	168	0,000	3,586 (2,217-5,799)
Not EBF	78 (49,7)	79 (50,3)	157		
Complementary Food					
On-Time(≥6 months)	131 (78)	37 (22)	168	0,000	3,586 (2,217-5,799)
Early (<6 months)	78 (49,7)	79 (50,3)	157		

Chi-Square Test

The results of the bivariate analysis showed that of the 12 sociodemographic variables tested, only 4 variables were associated with stunting events in Gorontalo with a p-value of < 0.05 . Associated factors include birth length ($p=0.000$), birth weight ($p=0.000$), exclusive breastfeeding (0.000), and complementary food ($p=0.000$).

Discussions

The length of the birth body is one of the factors associated with stunting. As many as 67 (54%) babies born with a body length of < 48 cm were stunted. This is in line with the results of the study (Hastuti et al., 2020) namely that stunted babies are at greater risk of stunting in the future. The length of the birth body and the height of the mother are predictors of stunting in children (Alim et al., 2019). The length of the baby is one of the indicators of nutritional adequacy during pregnancy. The length of the baby that is not optimal indicates that the mother is malnourished for a long time during her pregnancy. The underlying factors include knowledge and education (Nuraini et al., 2021). Although in this study the two factors are not related, many studies state that the two are closely related (Siregar, 2023). In addition to birth length, another body weight is an indicator of the nutritional state of the mother and fetus (Putri et al., 2022) and the most

dominant factor of stunting risk (Aryastami et al., 2017). Fulfillment of adequate nutrition with exclusive breastfeeding and quality complementary foods is an effort to pursue the baby's height that is lacking so that the baby can grow optimally.

As many as 40 (74.1%) low birth weight babies or < 2500 gr are stunted. Lack of nutrients during pregnancy has a long impact on the fetus which does not grow optimally. Weight gain that is not by gestational age should be a special concern for the possibility of Intra Uterine Growth Restriction (IUGR) which is another dominant factor causing stunting (Flores-Guillén et al., 2020). The occurrence of IUGR indicates that there has been an abnormality in the growth of the baby since the womb. This is a problem that must be solved because the occurrence of IUGR or LBW can be caused by the education of fathers and mothers (Flores-Guillén et al., 2020). Routine antenatal care is important. Monitoring of pregnant women's weight gain needs to be improved by midwives as well as doctors and health workers, as well as providing knowledge and understanding of the importance of fulfilling nutrition during pregnancy both to pregnant women and families.

Exclusive breastfeeding reduces the risk of stunting by up to three times. A total of 79 (50.3%) children who were not exclusively

breastfed experienced stunting by the results of the study (Jama et al., 2020; Sari et al., 2021). Breast milk contains many substances needed and has the content most suitable for the needs of the child. The failure of exclusive children's foods were other than breastmilk as early as 2–3 months of age. Among these mothers, formula milk and rice porridge were the most commonly fed items (Hadi et al., 2021). Some things that can be improved include the promotion of education for women, husband engagement, encouraging antenatal care follow-up, and counseling of exclusive breastfeeding during antenatal care recommended to improve exclusive breastfeeding practice (Jama et al., 2020). The provision of information and motivation to breastfeed exclusively should have been given since pregnancy. Understanding and forming attitudes takes time and process, as well as support. So that the gift is not only for pregnant women but involves husbands and families.

The last factor directly associated with stunting is the provision of complementary breast milk (MPASI) too early or < 6 months. As many as 79 (50.3%) babies who were given complementary food early were stunted. This is in line with the results of research conducted by (Masuke et al., 2021)) which breastfeeding is caused by several factors

such as not producing enough breastmilk, not having a place to breastfeed in the workplace, being busy, and children frequently crying. Some lactating mothers stated that they fed their shows that inappropriate and insufficient provision of complementary food will increase the risk of stunting, wasting, and being underweight. Exclusive breastfeeding and complementary feeding of breast milk as well as intake supplements such as vitamin A can reduce the risk of stunting (Amer & Veldkamp, 2018). The adequacy of nutrients during the first thousand days of life becomes the basic capital of the child's growth, so inadequate feeding will hinder the growth of the child. The provision of knowledge and simulation of the use of local food for the provision of complementary food should be given since pregnancy and become a routine program of posyandu.

CONCLUSION

It can be concluded that sociodemographic factors are predictors of stunting in children. Factors of the length of the body, birth weight, exclusive breastfeeding, and complementary food directly while other factors are not oriented towards stunting. Based on these findings, concrete steps are needed to reduce the high rate of stunting, including the need for screening the nutritional status of mothers. In addition,

monitoring the weight gain of mothers during pregnancy is one of the indicators that must always be considered. Providing information and strengthening the importance of exclusive breastfeeding and complementary food is a factor supporting the success of exclusive breastfeeding and complementary food and reducing stunting.

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THANK YOU

The researcher stated that there was no conflict of interest in the study. In the process of collecting research data, researchers have been assisted by enumerators so that researchers express their gratitude for the cooperation and support of cadres and midwives from 8 villages in Tilango District, Gorontalo Regency.

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