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Determinants of Stunting in Siantan Hulu Subdistrict, North Pontianak Based on Spidergram Analysis

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ABSTRACT

Stunting is a child's growth and development disorder which is characterized by a lack of nutritional intake, infection, or inadequate stimulation (WHO). Results from the Indonesian Nutrition Status Survey (INSS), the prevalence of stunted toddlers in districts/cities in West Kalimantan in 2022 reached 27.8%. The figure in Pontianak City, 19.7%, is still higher than the national figure, but has fallen from before. The national target is that the prevalence of stunting reaches 14% by 2024. The aim of this research is to determine the determinants of stunting in Siantan Hulu Village. This type of research is descriptive observational research. The number of samples in this study was 80 respondents, namely households with toddlers aged 24 - 59 months in Siantan Hulu Village. Data analysis using spidegram. The results of the analysis using spidergram showed that the determinants of stunting in Siantan Hulu Village included characteristics of toddlers, exposure to cigarette smoke, health services, immunization history and stunting IEC. Meanwhile, maternal characteristics, early initiation of breastfeeding, exclusive breastfeeding, household sanitation and water are not significant determinants of stunting in Siantan Hulu Village.

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1. INTRODUCTION

In the field of health and nutrition, the term "Stunting" is used to describe a condition where the physical growth and development of a child is hampered or delayed due to ongoing malnutrition, especially during the initial growth period or golden period. The golden period is the period that starts in the womb until the child is 2 years old. Stunting itself is when a child does not reach the height he should be for his age. This is an important measure for evaluating the quality of children's health and nutrition[1].

Stunting is an indicator of chronic malnutrition that occurs in toddlers, this includes lack of nutritional intake, lack of nutritional intake for mothers and children, especially protein and micronutrients. Stunting is the cause of almost half of under-five deaths. In the long term, stunting can affect a child's physical and cognitive development, this can affect their ability to learn, develop and contribute to society when they grow up. Energy and protein intake affects toddlers' motor development, so toddlers who lack energy and protein tend to experience stunting problems and impaired motor development[2].

In an effort to reduce the risk of stunting, it is necessary to learn more about the causes of stunting, including sensitive nutrition and specific nutritional problems. Sensitive nutrition is related to indirect causes of stunting, while specific nutrition is a direct cause of stunting. Growth delays in early childhood can be reversible[3]. During the first 1000 days of life, children under five years of age (toddlers) are given special nutrition. However, this intervention only contributed to reducing stunting by 30%. Providing additional food is one of the interventions carried out. Children aged 0-6 months receive early initiation of breastfeeding, which means they receive breast milk exclusively, then after the baby is over 6 months old they receive complementary foods. They also receive deworming medication, high doses of vitamin A, complete immunization, and diarrhea prevention and treatment. For pregnant women, 90 blood supplement tablets are given. Meanwhile, sensitive nutrition

involves other fields besides health and contributes as much as 70% to reducing stunting rates. This includes providing access to clean water, parenting education, reproductive education, social security for poor families, provision of health and family planning services, and improving the quality of health care[4].

In Indonesia, the problem of stunting has received more attention from the government. This has been proven by the fact that the stunting prevalence rate in Indonesia according to the 2022 Indonesian Nutrition Status Survey reached 21.6%. The prevalence rate of stunted toddlers (height for age) in districts/cities in West Kalimantan in 2022 based on the results of the Indonesian Nutrition Status Survey reached 27.8%. Meanwhile, the prevalence rate in Pontianak City reached 19.7%, this is still higher than the national figure, but has decreased from the previous figure. It is targeted that by 2024 the stunting prevalence rate will reach 14% in accordance with the national target[5]. Data on the stunting rate from the health service in Pontianak City in 2022 will reach 17.4%. Siantan Hulu Subdistrict is a special location for stunting with the highest rate in Pontianak City (10.4%). The aim of this research is to determine the determinants of stunting in Siantan Hulu Village.

2. METHOD

This type of research is descriptive observational research. The number of samples in this study was 80 respondents, namely households with stunted toddlers aged 24 - 59 months in Siantan Hulu Village. Respondents were selected using a purposive sampling technique using the method of taking toddlers with birth ages from 2019 – 2022.

The types of data collected include primary data (data collected directly at the research location using a questionnaire), and secondary data (data on stunted toddlers from the Community Health Center and Pontianak City Health Service). The technique for collecting primary data is a health survey using the Cobocollect application for respondents and direct observation of the community using purposive sampling and analysis of causal determinant factors using spidergram diagrams.

3. RESULT AND DISCUSSION

Based on research conducted, the characteristics of mothers who have stunted toddlers can be seen in the frequency distribution table as follows:

Table 1 Frequency Distribution of Respondents based on Characteristics of Stunting Mothers of Toddlers

Variable	N	%
Mother's Education		
Low	40	49.9
SHS	31	38.8
College	9	11.3
Mother's Height		
< 150 cm	25	31.2
> 150 cm	55	68.8
Age of First Birth		
< 20 Years and or > 35 Years	19	23.7
20-35 Years	61	76.3
LILA Size		
Risk CED	10	12.5
No Risk CED	70	87.5

Source: Primary Data, 2023

The results of data in the field showed that the characteristics of mothers who had stunted toddlers were that some mothers had low education (49.9%), mother's height < 150 cm (31.2%), age at birth of first child < 20 years and/or > 35 years (23.7%), and Chronic Energy Deficiency (CED) (12.5%). Education can influence whether it is easy for someone to absorb and understand what is learned. The higher a person's level of education, the better their knowledge[6]. In line with the findings of this research which shows that the majority of mothers who have stunted children have completed high school/high school education at 38.8%. This is supported by previous research

findings which also prove that there is a significant relationship between the mother's education level and the incidence of stunting [7]–[9]. The lower the mother's education level, the greater the risk of the toddler experiencing stunting[10].

Maternal height is also a factor that contributes to the incidence of stunting in toddlers. This study found that 31.2% of mothers whose height was <150 cm had their children stunted. As previous research supports this research which shows that maternal height is a risk factor for stunting, mothers with a height of less than 150 cm have a risk of having stunted children compared to mothers of normal height, namely more than 150 cm. [8], [11], [12]. The risk of stunting increases as the mother's height decreases, and children of short parents have the highest risk of stunting [12]. These findings, especially the association between maternal height and stunting, are consistent with most previous studies[13]. Several chromosomes (such as the 7th, 8th, 20th and sex chromosomes) play a role in the development of human height. Thus, both mother and father can pass on the genes that determine height to their offspring[14]–[16].

Apart from that, the mother's age when pregnant also affects her child's health. Mothers who are pregnant and give birth at the age of less than 20 years are at risk of having stunted children. Based on previous research, it has been proven that early pregnancy (< 20 years) is an indirect factor in the incidence of stunting[17]. In contrast to previous research which showed that there was no significant relationship between the incidence of stunting between mothers who experienced early marriage and those who did not experience early marriage[18].

The size of the upper arm circumference in pregnant women greatly influences the mother's nutritional status, if the mother's circumference is less than 23.5 cm then the mother experiences Chronic Energy Deficiency (CED), the mother's nutritional status is good when determining the growth and development of the fetus, if the mother's nutritional status is poor then it will contribute to the incidence of stunting [19], [20]. Based on the results of research in the field, the majority of mothers who have stunted toddlers are not at risk of Chronic Energy Deficiency (CED), namely 70 (87%), in contrast to research by Aprillia, et al (2023) which states that there is a significant relationship between the mother's history of CED and the incidence of CED. stunting[21].

Table 2 Frequency Distribution of Respondents based on Characteristics of Stunted Toddlers

Variable	N	%
Birth Weight		
LBW	9	11,3
Non - LBW	71	88,8
Body Length at Birth		
Very Short	63	78,8
Short	17	21,3
Jarak Kelahiran		
< 2 Years	33	41,3
> 2 Years	47	58,8
Age of Birth		
Premature	2	2,5
Not Premature	78	97,5
History of Infectious Diseases		
Ever	73	91,3
Never	7	8.8

Source: Primary Data, 2023

The results in the field showed that the majority of stunted toddlers had a non-LBW birth weight (88.8%), a very short birth length (78.8%), a birth distance of >2 years from the previous child (58.8%), an age at birth. 9 months or Non Premature (97.5%) and history of infectious disease (91.3%). A baby's birth weight is classified as normal birth weight if the weight is ≥ 2500 grams and low birth weight if the birth weight is < 2500 grams. The baby's birth weight is usually associated with growth and development over a long period of time. The subsequent impact of LBW can be failure to thrive. Babies who are LBW have difficulty catching up with their initial growth, lagging

growth can cause the baby to experience stunting [22]. Based on the results of research in the field, it can be seen that the majority of toddlers who experience stunting have sufficient birth weight (Non LBW) at 88.8%, and the rest are LBW (11.3%). Several studies show that LBW has a significant relationship with the incidence of stunting [23]–[25], although the relationship is weak[26].

Birth length less than 48 inches has a higher risk of experiencing stunting [27]–[29]. This can happen if food intake while in the womb can affect the growth of the fetus until infancy, resulting in imperfect child growth and becoming a risk factor for stunting[30]. Based on the results of research in the field, it was found that 78.8% of toddlers who experienced stunting had a very short birth length of <48 cm. Toddlers with short birth lengths have a greater chance of experiencing stunting[31][32].

Factors that cause stunting include the distance between pregnancies or the age difference between the previous child and the next child. Children born with a birth distance of less than 2 years have a higher risk of stunting than children born with a birth distance of more than 2 years[33]. Based on the results of research in the field, it was found that the majority of stunted toddlers had a birth interval of more than 2 years, as much as 58%. The results of this study are in line with previous research[34].

Based on the results of research in the field, the majority of stunted toddlers have a history of infectious diseases, 91.3%. This shows that the more often toddlers suffer from infectious diseases, the more likely they are to experience nutritional problems because the energy needed for growth is diverted to fighting infections and sick children need more nutrition to fight the disease. As a result, inadequate nutritional intake causes malnutrition conditions that contribute to infection. Research by Agustia, et al (2020) shows that a history of infectious disease is a risk factor for stunting. Based on statistical tests, the OR value was 3.400. This shows that toddlers who suffer from infectious diseases are 3,400 times more likely to experience stunting than toddlers who do not suffer from infectious diseases[35].

Table 3 Frequency Distribution of Respondents Based on Cigarette Smoke Exposure

Variable	N	%
Husband's Smoking Behavior		
Smoking	56	70,0
No Smoking	24	30,0
Exposure to Cigarette Smoke During Pregnancy		
Yes	56	70,0
No	24	30,0
Exposure to Cigarette Smoke in Toddlers		
Yes	53	66,3
No	27	33,8

Source: Primary Data, 2023

The table above shows that most of the respondents' husbands smoked (70%), were exposed to cigarette smoke during pregnancy (70%) and their toddlers were exposed to cigarette smoke (66.3%). This is supported by the results of previous research which found that exposure to cigarette smoke both during pregnancy and after birth was associated with the incidence of stunting [6][36][37].

The majority of cigarette exposure occurs in children who live in rural areas and poor families. In addition, smoking fathers who smoke for more than 3 hours every day and smoking traditional or kretek cigarettes are factors that influence the incidence of stunting in children under 5 years old[38]. High smoking prevalence may contribute to the increase in stunting prevalence, especially among low-income families[39].

Table 4 Distribution and Frequency of Respondents based on Immunization history, exclusive breastfeeding and mother's knowledge about stunting

Variable	N	%
Immunization history		
Complete	37	46,3
No Complete	43	53,8
Exclusive Breastfeeding		
Yes	76	95,0

No	4	5,0
Mother's Knowledge About Stunting		
Know	36	45,0
Don't know	44	55,0

Source: Primary Data, 2023

This research found that the majority of respondents who had stunted toddlers had a history of incomplete immunization (53.8%), exclusive breastfeeding (95%) and did not know about stunting (55%). Immunization is very important for a child's immunity. Toddlers with a history of incomplete or no immunization are more susceptible to infection[40]. In line with research by Tauhidah (2020) which found that toddlers with an incomplete history of basic immunization had a 1,983 times risk of stunting when compared to toddlers with a complete history of basic immunization. The results of this study are in line with previous research, there is a relationship between a complete basic immunization history and an OR value of 1.508, which means that toddlers who have an incomplete immunization history are 1.508 times more at risk than toddlers with a complete basic immunization history[40][41].

One way to prevent stunting in toddlers is to start breastfeeding from an early age. In research conducted in Naerobi, Kenya, which investigated the relationship between breastfeeding and a person's nutritional status, it was found that there was a significant correlation between early initiation of breastfeeding and the incidence of stunting in children aged between 0 – 24 months[42]. Not in line with research by Kusumaningsih (2023) which states that there is a relationship between early initiation of breastfeeding and the incidence of stunting (OR = 7.438) [43]. Exclusive breastfeeding is giving only breast milk to babies from the age of zero months to six months, without any additional supplements. Breast milk is very important for fulfilling the baby's nutrition. Babies who consume breast milk also have strong immunity, which can reduce the risk of infectious diseases. Previous research shows that exclusive breastfeeding is a risk factor for stunting [21][35].

Stunting Education Information Communication is a very effective health education intervention media for increasing mothers' knowledge so that it can help change mothers' parenting patterns in providing nutrition to toddlers so as to prevent the risk of stunting[44]. The findings of this research are in line with previous research that the majority of mothers who have stunted toddlers do not know about stunting and its prevention [32][45]. The results of the spidergram analysis can be seen in the following diagram:

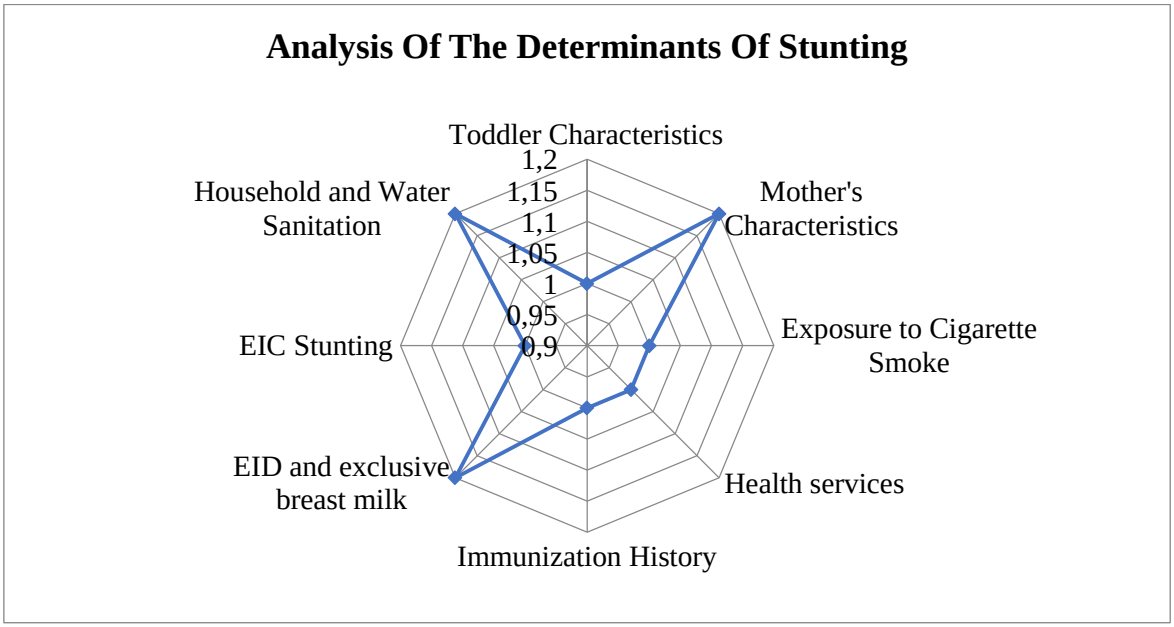

Figure 1 Spidergram Graphics

Based on the results of spidergram analysis, the determinants of stunting in Siantan Hulu subdistrict that are closest to the number "0" (zero), namely: Characteristics of Toddlers, Exposure to Cigarette Smoke, Health Services, Immunization History and IEC Stunting.

4. CONCLUSION

Based on the results of spidergram analysis of Determinants of Stunting in Siantan Hulu Subdistrict, North Pontianak. It can be concluded that the determinants of stunting in Siantan Hulu District include the characteristics of toddlers, exposure to cigarette smoke, health services, immunization history and stunting IEC. Meanwhile, maternal characteristics, early initiation of breastfeeding, exclusive breastfeeding, household sanitation and water are not significant determinants of stunting in Siantan Hulu Village

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