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Uncovering the Incidence of Stunting Risk in Children Age 6-24 Months at Wosi Health Center West Papua Province

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A B S T R A C T

The study aims to reveal the risk factors for children aged 6-24 months at risk of stunting. At the Wosi Health Center. Types of analytical research, cross-sectional study approach. A sample of 73 people, taken by the Purposive Sampling technique. Analystsare Univariate, chi square, Prevalence Ratio and logistic regression data. The research findings are that there is a significance between exclusive breastfeeding parenting, infectious diseases and significant immunization status P = <0.05. The relationship between side dishes (SD)-BM parenting, toilet sanitation, number of members in the family, economic status, and LBW history was not significant P = >0.05. The results of the Prevalence Ratio (PR) value of the variable of the parenting history of exclusive breastfeeding had the most effect on the risk of stunting incidence with a risk value of 5.55 times.

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INTRODUCTION

Stunting is a condition of malnutrition that lasts for a long time, especially during the most crucial period of growth and development in early life (Christin Angelina F., 2019). This term refers to the short body condition of children that generally occur in children < 5 years old due to chronic malnutrition and recurrent infections during the period of the first 1,000 days of life (FDL) starting from the fetus to the age of the child reaching 24 months. Stunting is characterized by the measurement of height or height according to age that is below minus two standard deviations (-2 SD) (Ariana, 2020).

The incidence of stunting in children <5 years old shows an increase of 17.9%, with the prevalence in 2022 reaching 22.3% (WHO, 2022). In 2017, more than half of the world's stunting cases were found in Asia (55%), while about 39% were in Africa. Of the total 83.6 million children who are stunted in Asia, most come from South Asia (58.7%) and the smallest proportion from Central Asia (0.9%) (Hidayani et al., 2022).

According to data from the World Health Organization (WHO), Indonesia is included in the group of countries with a fairly high stunting rate (Hidayani et al., 2022). Based on the results of the 2023 Indonesian Health Survey (SKI), the prevalence of stunting has only slightly decreased by 0.1%, from 21.6% in 2022 to 21.5% in 2023 (Indonesian Health Survey, 2023).

Stunting is one of the targets of the SDGs (Sustainable Development Goals) in sustainable development 2, namely eliminating hunger and all forms of malnutrition by 2030 and achieving food security.(Ministry of Health 2018). The impacts caused by stunting are increased incidence of illness and death, suboptimal cognitive, motoric, and verbal development in children, increased health costs, increased risk of obesity and other diseases, decreased reproductive health, suboptimal learning capacity and performance during school and suboptimal productivity and work capacity.(Ministry of Health 2018).

Stunting is caused by various factors such as inadequate nutritional intake, exclusive provision of BM, SD-BM and infectious diseases, history of LBW, immunization status, food availability, socio-economic status, parenting patterns and health services.(Wardita et al, 2021).

Result research conducted by Nyoman et al (2017) showed that parenting patterns are related to the incidence of stunting.(I Dewa Nyoman Supariasa 2017). The benefits of exclusive BM are to improve health and intelligence optimally.(Sampe, Toban, and Madi 2020). Another study conducted by Rahayu, et al. (2018) found that households that do not have access to drinking water that meets the criteria are at greater risk of stunting (Rahayu, RM, Pamungkasari, EP and Wekadigunawan 2018). Overall, according to research, the water, sanitation, and hygiene (WASH) factor is a factor that can cause stunting.(Ariana 2020).

Research in Madagascar and Somalia found that the number of family members was associated with the incidence of stunting.(Rakotomanana H, Gates GE and In 2017) (Kinyoki DK, Berkley JA and Kandala NB 2015). Wrong family parenting patterns such as getting older children used to getting more food or nutritional intake than younger children (toddlers) can also be a factor that

influences the high number of stunting cases in toddlers who actually come from small families.(Christin Angelina, 2019).

The number of family members living in the same house will affect food availability, this is related to access to stunting. Result research conducted by (Lia et al., 2021) shows that 76% of families with stunted toddlers have incomes below the regional minimum wage.(Agustin and Rahmawati 2021).

In addition to economic status factors, several child factors can affect the incidence of stunting, namely immunization factors, infectious diseases and a history of LBW. Where children with a history of LBW can interfere with the growth and development of children and low birth weight babies are an important aspect in the high rate of infant mortality, disease, and disability. Then, they also experience long-term impacts on their well-being in the future, including developmental disorders so that they are at risk of stunting(Zahra Izzati and Ermi 2024). The immunization status factor affects the risk of children being susceptible to infectious diseases. immunization is an action and effort to increase a person's immunity to a disease. The benefits of providing immunization are to reduce morbidity, disability and mortality rates in children where it is hoped that it can reduce the chain of transmission of infectious diseases Result this study is not in line with the theory that vaccines can reduce the risk of death in children. Early vaccination can reduce the incidence of stunting(Anggraeni, Dewi, and Ginting 2023).

Based on a preliminary study conducted by the Manokwari Regency Stunting Reduction Acceleration Task Force in 2024, the number of stunted toddlers until February 2024 was 424 toddlers (8%), where the number of toddlers experiencing stunting was 292 toddlers and toddlers experiencing stunting were 132 toddlers. The status of very short stunted toddlers was 99 toddlers and short was 325 toddlers. Based on Regional data, West Manokwari District has the highest number of stunted toddler data in Manokwari Regency with the number of short toddlers being 95 toddlers and very short toddlers being 18 toddlers. The number of short toddlers in the Wosi Health Center Working Area was 29 children and very short was 2 children. According to the researcher's assumption that there are many risk factors that cause stunting, so the researcher is interested in examining several factors that according to the researcher are risk factors from the mother or family as well as risk factors originating from the child, so the researcher is interested in conducting research on whether maternal factors or child factors are related to the risk of stunting in children aged 6-24 months at the Wosi Health Center as a research location that has never been researched related to stunting risk factors.

Meta Synthesis (Review of Previous Research)

Research on the risk of stunting was conducted by Satria in 2019 and the results were that the relationship between BM provision, SDBM provision, and parental knowledge was significant with the incidence of stunting (Satria, 2019). The same thing was done by Setiawan, 2018 who found that there was a significant relationship between the level of energy intake, history of infectious disease duration, birth weight, maternal education level and family income level

with the incidence of stunting. The level of maternal education has a dominant relationship with the incidence of stunting (Setiawan, 2018). Low access to appropriate SDBM, child gender, food insecurity, poor socioeconomic status and low knowledge about stunting are the main predictors of stunting in children aged 6-59 months (Bukusuba, J, et al. 2017).

The same study was also conducted by Maradzika and found Result that the main factor causing stunting among children aged 0-59 months, was found to be a lack of maternal education, children were associated with mothers being unemployed, living in high-density suburbs, children had been hospitalized, were breastfed after > 1 hour of birth, SDBM < 6 months, LBW and poor diet (Maradzika, J, et al. 2016).

Frame of Mind

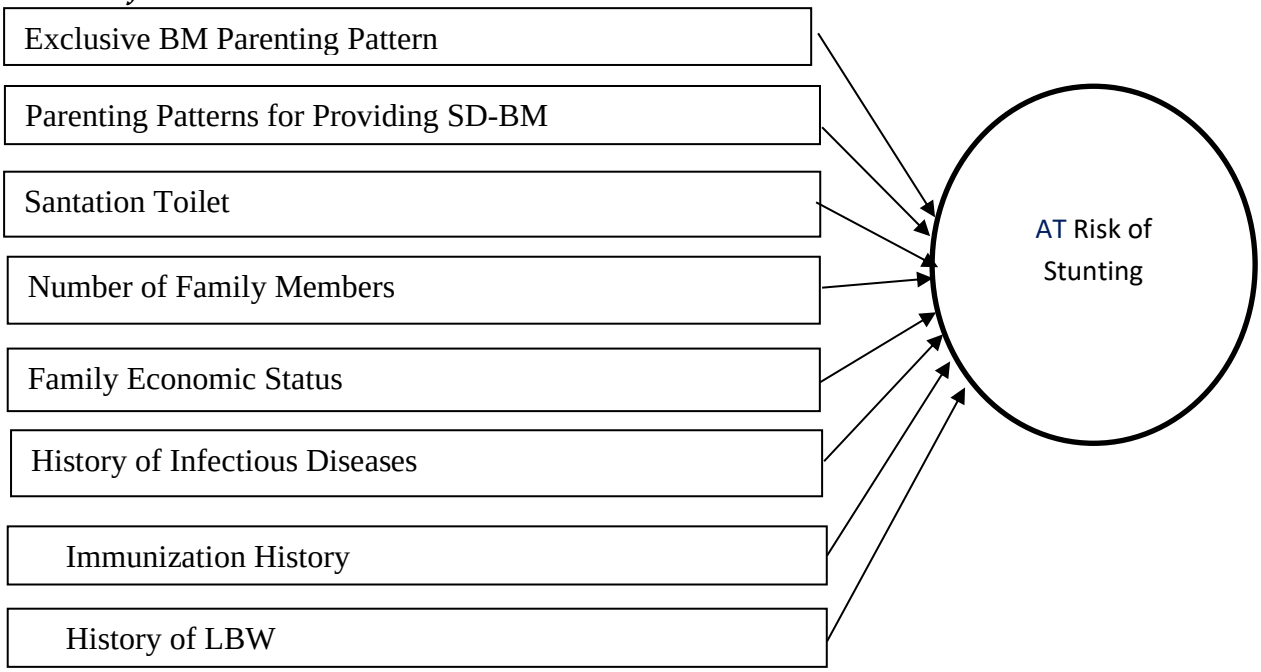

Figure 1. Conceptual Framework

METHODOLOGY

This study uses an observational analytical method with a cross sectional design, which is a study that aims to study the dynamics of the correlation between risk factors and effects, by approaching, observing or collecting data at the same time (Hasmi, 2023). The sample was 73 samples taken using purposive sampling technique.Data is analyzed withunivariate (Proportion), bivariate (chi Square, Prevalence Ratio), Multivariate (Logistic Regression) analysis.

RESEARCH RESULTS

Univariate Analysis

Table 1. Independent variable distribution

No	Variables	Frequency (n)	Presentation (%)
1	Age		
	< 20 years old	2	2.7
	20-35 years old	63	86.3
	>35 years old	8	10.9
2	Tribe		
	Papua	22	30.1
	Non-Papuan	51	68.9
3	Education		
	Elementary School	7	9.6
	Secondary Education	43	58.9
	higher education	23	31.5
4	Work		
	Work	30	41.1
	Not Working	43	58.9
Sum		91	100

Table 1 shows that the majority of the children's parents are aged 20-35 years (63 people) and the majority are non-Papuan (51 people) (68.9%), the majority are secondary education (43 people) (58.9%) and the majority are unemployed (43 people) (58.9%).

Bivariate Analysis

Table 2. Chi Square Analysis and Prevalence Ratio

No	Variable	At Risk of Stunting				n	%	*p-value*
1	Exclusive BM Grant	Risk		No Risk				
		n	%	N	%			
	Yes	18	40	27	60	45	100	0.008
	No	3	10.7	25	89.3	28	100	
2	MP BM Granting							
	Not Age Appropriate	5	33.3	10	66.7	15	100	0.71
	In accordance	16	27.6	42	72.4	58	100	
3	Sanitarian Toilet							
	Not enough	5	21.7	18	78.3	23	100	0.571
	Good	16	32	34	68	50		
4	Number of Family Members							
	More	13	40.6	19	59.4	32	100	0.068
	Enough	8	19.5	33	80.5	41	100	
5	Economic Status							
	Not enough	9	32.1	19	67.9	28	100	0.791
	Good	12	26.7	33	73.3	26	100	

6	History of Infectious Diseases						
	Yes	17	37.8	28	62.2	45	100	0.036
	No	4	14.3	24	85.7	28	100	
7	Immunization Status History						
	Incomplete	15	45.5	18	54.5	33	100	0.007
	Complete	6	15.4	33	84.6	39	100	
8	History of LBW						
	Yes	3	33.3	6	66.7	9	100	0.711
	No	18	28.1	46	71.9	64	100	

Based on the table above, it is known that result Chi Square test conducted on 8 variables showed that the variables that were significant with the risk of stunting in children aged 6-24 months were, in sequence, the provision of exclusive BM p value = 0.008, history of infectious diseases p value = 0.036, history of immunization status p value = 0.007. While the variables that are not significant are parenting patterns of providing SD-BM, Sanitation toilets, number of family members, socioeconomic status, and history of LBW.

Multivariate Analysis

Table 3. Multiple Logistic Regression Variable Analysis

No	Variable	B	*p-value*	OR	95% CI for Exp(B)	
					Lower	Upper
1	Exclusive BM Grant		0.008	5.55	18,049	293,638
2	immunization status		0.007	4.34		
3	History of Infectious Diseases		0.036	3.64		

Source: Primary Data, 2025

The table above shows that the exclusive BM parenting pattern variable has a significant relationship with the incidence of stunting risk with a Ratio Risk value of 5.55. The immunization status variable has a significant relationship with the incidence of stunting risk with a Ratio Risk value of 4.34. The infectious disease history variable has a significant relationship with the incidence of stunting risk with a Ratio Risk value of 3.64. Based on the Result multivariate analysis by testing the variables that have a relationship, it was obtained that the Result parenting pattern variable of exclusive BM is the variable that has the most influence on the incidence of stunting risk with a RR value of 5.55 followed by the immunization status variable and history of infectious diseases.

DISCUSSION

Exclusive BM Parenting Patterns and the Risk of Stunting

The results of the study showed that children who received exclusive breastfeeding had a lower risk of stunting. Statistical tests in this study showed a relationship between parenting in exclusive breastfeeding and the incidence of stunting in children aged 6–24 months.

Breast milk is milk produced by the mother and contains all the nutrients that the baby needs to grow and develop optimally. Exclusive breastfeeding means that babies are only given breast milk without additional liquids such as formula milk, fruit juice, honey, tea, water, or solid foods such as bananas, papayas, milk porridge, biscuits, team rice, and others during the first six months of life (Mufdlilah, 2017).

The protein and vitamin content in breast milk plays a role in warding off and neutralizing bacteria, viruses, fungi, and parasites, improving the functioning of the digestive system, maintaining the baby's immunity, and preventing infections. Therefore, babies who get exclusive breastfeeding rarely experience disorders such as diarrhea or malabsorption. Impaired absorption of macro and micronutrients will obviously affect the growth and development of babies, especially in the early days of life. Colostrum in breast milk also contains fats that are important for brain formation and lactose as a source of energy for babies (Hidayani et al., 2022).

These results are similar to a study by Christin et al. (2018) which found that the proportion of stunting incidence in toddlers aged 6–23 months was higher in children who did not receive exclusive breastfeeding (26.6%) compared to those who received it (11.4%). (Christin Angelina F. & Agung Aji Perdana, 2019).

Growth and development during infancy requires a balanced and abundant nutritional intake. However, the baby's ability to digest food is highly dependent on the maturity of his digestive system. The only intake that corresponds to these conditions during the first few months is breast milk. Babies who do not receive exclusive breast milk are at risk of developing nutritional deficiencies that are essential for their growth and development. This can result in growth disorders that lead to stunting (Christin Angelina F. & Agung Aji Perdana, 2019).

The study also found that some babies were not given exclusive breastfeeding because parents thought the baby often cried because they were not full with breast milk alone. As a result, they were given formula milk. In fact, the nutritional content in formula milk is not comparable to breast milk and does not have immune substances like breast milk. In addition, formula feeding must pay attention to the cleanliness of the milk bottle and the water source used so as not to cause indigestion. (Hidayani et al., 2022).

Parenting Patterns of SD-BM Provision

Result researchshows that children who are not given SD-BM on time are at least not at risk of stunting.Result statistical test of the study showed that there

was no relationship between the parenting pattern of providing SD-BM and the risk of stunting in children aged 6-24 months.

This result is not the same as the research of Kurniadi (2019) which found that children with human resources under the age of 6 months or more than 6 months have a 3.78 times greater potential to develop stunting compared to children who are given human resources right at the age of 6 months (Kurniadi 2019). The need for increased nutrition can not only be provided by BM but there must be complementary foods to BM that cause birth to be closely related to long-term growth and development.(Ariana 2020).

This is because even though the child is given SD-BM on time, the SD-BM food menu pattern is not varied and is not balanced and the child suffers from infectious diseases, this will affect their growth and development. Giving SD-BM at the right time is very beneficial for fulfilling the nutritional needs and growth of the baby and is a period of transition from exclusive BM to family food. It should be noted that giving SD-BM too early will not meet the nutritional needs of the baby. In addition, the baby's digestive system will experience disorders, such as stomach aches, constipation and allergies. In addition, a baby who is given SD-BM early will have difficulty sleeping at night(I Dewa Nyoman Supariasa 2017).

Early SD-BM administration has a bad impact on children because the baby's digestive organs are not ready to receive other foods other than BM, as a result of which the baby's stomach and intestines are injured. Other research results explain that early complementary feeding causes malnutrition problems in children because the nutritional content of the food given is inadequate (Kebijaksanaan Roh Kudus 2023).

According to the researcher's assumption that Result this study shows that there are 9 babies whose SD-BM administration time is less than 6 months. This can cause children to experience the risk of stunting because it must be noted that giving SD-BM too early means that the nutritional intake needed by the baby does not match their needs. In addition, the baby's digestive system will experience disorders, such as stomach ache, constipation and allergies. In addition, a baby who is given SD-BM early will have difficulty sleeping at night which causes growth and development disorders in the baby.

Santation Toilets and the Risk of Stunting

The relationship between toilet sanitation and the risk of stunting is not significant. Study is not in line with the research conducted by Torlesse, H, et al (2016) in his research explaining the chances of stunting occurring and its relationship to sanitation from Result. There are studies have shown that the risk of stunting is lower in households that have access to better sanitation.(Ariana 2020). The low quality of sanitation and environmental cleanliness can trigger digestive tract disorders which result in the energy needed by the body for growth being diverted to be used for the body's resistance to infection. If toddlers often experience infectious diseases, nutritional problems will arise, one of which is stunting.(Ariana 2020).

This is because even though there are some respondents whose santation toilets are shared with other families and pose a risk of stunting, if the santation environment is clean, access to clean water is good and families have good hand washing behavior, this will reduce the risk of stunting.

One of the environmental sanitation conditions is poor sanitation of toilets, which can cause various types of diseases, including diarrhea, worms, and digestive tract infections. If a child suffers from a digestive tract infection, the absorption of nutrients will be disrupted, which causes nutritional deficiencies. A person who lacks nutrients will be susceptible to disease, and growth will be disrupted.(I Dewa Nyoman Supariasa 2017).

The Number of Family Members and the Risk of Stunting

Result research shows that the number of family members more than 4 people is less at risk of experiencing stunting. This study is in line with research conducted by Fitri in 2012 in Depok where toddlers who have fewer siblings are not necessarily free from stunting. Because it could be a factor of unfair food distribution that can also result in toddlers getting less food, so that their nutritional intake is also lacking.(Christin Angelina F., Agung Aji Perdana 2019).

This study is not in line with studies conducted in Madagascar and Somalia, which showed a relationship between the number of family members and the incidence of stunting (Zogara et al., 2020). This is allegedly caused by limited food supplies and competition in obtaining food.

Improper family parenting, such as the habit of giving more portions of food or nutritional intake to older children than toddlers, can also be a factor that contributes to the high rate of stunting in early childhood (Christin Angelina F. & Agung Aji Perdana, 2019).

Economic Status

The results of the study showed that the group with low economic status did not experience the risk of stunting. This finding is different from the findings of Utami et al. (2017) and Omondi & Kirabira (2016), who found that family income is significant in the incidence of stunting in toddlers. Family income can be a risk factor for stunting because it is related to the adequacy of children's energy and protein intake. The availability of food in the family is also a risk factor for stunted child growth (Ariana, 2020).

Low economic status makes the power to buy nutritious food decrease, thus putting them at risk of malnutrition. Nutritional deficiencies in toddlers and pregnant women can increase the risk of stunting (Mugiati, 2018). Stunting cases are more commonly found in communities with low socioeconomic conditions. This is due to a lack of understanding of nutrition, diet, and personal hygiene habits (Mohammed et al., 2019).

History Infectious Diseases

The results of the study showed that children who had been sick with previous infections were at risk of stunting. Children who have had diarrhea have the potential to be stunted.. Infectious diseases correlate with nutritional

status index. Diarrhea and ISPA are related to stunting. Research in Libya also found that diarrhea is the trigger of stunting in children < 5 years old (I Dewa Nyoman Supariasa 2017).

Research by Agustia, et al. (2018) also revealed that the infectious diseases suffered are a risk factor for stunting. The results of the statistical test were obtained OR = 3,400 (Agustia, R., Rahman, N. 2018).

Tando (2012) in Ariati (2019) explained that health status in the form of frequency and duration of illness in toddlers poses a risk of stunting in children. Toddlers who experience malnutrition can cause infections due to low immunity, so they will be susceptible to disease. On the other hand, if infectious diseases occur frequently, it will cause a person to experience malnutrition because appetite decreases.(Elliott 2019).

Immunization Status History and the Risk of Stunting

Result research shows that kids with complete immunization are less at risk of experiencing stunting. Giving immunization to children is urgen, By immunization, children can get immunity and prevent diseases such as hepatitis B, diphtheria, pertussis, tetanus, pulmonary TB, measles and rubella. Children who do not receive immunization have lower immunity than children who receive immunization. So it will increase the risk of illness. If the child is sick, the child's appetite will decrease, and inhibit the process of nutrient absorption in the body. So the child's weight will decrease(Hidayani et al. 2022).

If the child is sick for a long time, he will be at risk of stunting. So people need to complete their basic immunizations so that they are not stunting (Hidayani et al. 2022). This finding is the same as the result of Hidayani's research that children who are not fully immunized are 1.6 times more at risk of stunting (Hidayani et al. 2022).

History of Low Birth Weight (LBW)

Research has found that children who do not have a history of LBW are actually at risk of stunting. This finding is different from the results of Pibriyanti et al.'s (2019) research, which found that weight at birth affects the incidence of stunting, babies with a history of LBW have a 15.3 times higher chance of experiencing stunting. Babies with LBW generally experience obstacles in pursuing optimal growth from an early age, which ultimately puts them at risk of stunting (Pibriyanti, K., Suryono, & Luthfi, 2019).

Birth weight itself is influenced by the growth process of the fetus during pregnancy and the nutritional intake of pregnant women. If the growth of the fetus has been stunted since the womb, then it is likely that the baby will experience growth retardation after birth. Therefore, it is important to ensure nutritional adequacy during pregnancy to prevent stunting in the future (Pibriyanti, K., Suryono, & Luthfi, 2019).

CONCLUSION

1. The pattern of providing exclusive BM parenting is significantly related to the incidence of stunting risk in children aged 6-24 months at the Wusi Health Center, West Papua Province.

2. The parenting pattern of providing SD-BM was not significantly related to the incidence of stunting risk in children aged 6-24 months at the Wolsi Health Center, West Papua Province.
3. Sanitation toilets are insignificant associated with the risk of stunting in children aged 6-24 months at the Wusi Health Center, West Papua Province.
4. The number of family members was not significantly related to the incidence of stunting risk in children aged 6-24 months at the Wolsi Health Center, West Papua Province.
5. Economic status is not significantly related to the incidence of stunting risk in children aged 6-24 months at the Wusi Health Center, West Papua Province.
6. Infectious diseases are not significantly related to the risk of stunting in children aged 6-24 months at the Wusi Health Center, West Papua Province.
7. Significant immunization status is related to the incidence of stunting risk in children aged 6-24 months at the Wolsi Health Center, West Papua Province.
8. The history of LBW was not significantly related to the risk of stunting in children aged 6-24 months at the Wolsi Health Center, West Papua Province.

RECOMMENDATION

The Health Center should increase counseling for pregnant women and mothers with babies/toddlers regarding food sources based on a balanced nutritional menu based on age, various types of food for toddlers and according to the function of the toddler's body.

FURTHER STUDY

It is hoped that further researchers will conduct similar research by adding other variables related to the incidence of stunting in toddlers so that parents, especially mothers, are more aware of other factors that cause stunting.

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