
THE EFFECT OF RISK FACTORS ON STUNTING EVENTS THE TITI PAPAN PUSKESMAS, MABAR HILIR KELURAHAN, MEDAN DELI DISTRICT MEDAN CITY, 2021

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ABSTRACT

The World Health Organization (WHO) collected stunting data showing that Indonesia is one of the three countries with the highest prevalence in the South-East Asia Region (SEAR). Health problems that affect infants are stunting or short stature due to chronic malnutrition where malnutrition is a global problem, including in Indonesia. This research is an analytic observational study with a case control study. The design was carried out at the Titi Papan Health Center, Mabar Hilir District, Medan Deli Regency in 2021 to analyze the influence of risk factors on stunting events with a sample of 88 children under five, 44 cases and 44 controls, sampling was carried out purposively where cases and controls were taken in one population. Data were obtained from Puskesmas, Medan City Health Office, observations, direct interviews with respondents using questionnaires. The results of the study concluded that the most influential variable on the incidence of stunting was family income ($p = 0.000$, $Exp(B) = 9.208$). Factors that significantly influence the incidence of stunting are birth weight ($p = 0.001$, $OR = 2.375$), education ($p = 0.001$, $OR = 6.923$), family income ($p = 0.000$, $OR = 15.857$), availability of clean water facilities ($p = 0.000$, $OR = 9.643$), family latrine facilities ($p = 0.001$, $OR = 2.333$), sewerage ownership ($p = 0.000$), $OR = 0.405$. The need for intensive counseling by health workers regarding factors related to stunting, to increase public awareness to change bad habits that are contrary to health and can cause stunting in toddlers.

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INTRODUCTION

There are 4 factors that influence the degree of human health, namely behavior, health services and heredity as well as environmental factors that play a major role in this. From the environmental aspect, the problem of ownership of healthy latrines and the provision of clean water still needs to be considered (Aksoy, 2017).

One of the health problems that affect infants is stunting or short stature due to chronic malnutrition where malnutrition is a global problem, including in Indonesia. Fulfillment of nutrition that has not been fulfilled both from the womb until the baby is born can cause various health problems that affect the mother and baby (Ananda, 2022)(Ati, n.d.)(Awa, Ojiabo, & Emecheta, 2015).

Environmental sanitation problems need to be monitored on environmental factors because they affect human health (Ayandibu & Houghton, 2017). Activities that can be done in this case are cleaning the house and yard regularly, cleaning bathrooms and toilets, cleaning drains and using clean water (Belch & Belch, 2004) (Chege & Wang, 2020)

Some of the scopes of environmental sanitation are the existence of healthy latrines and the availability of clean water (Pinontoan and Sumampouw, 2019). Environmental sanitation is an indirect factor causing stunting and the other is insufficient access to food, maternal care and health services (Etuk, Etuk, & Michael, 2014)(Fanida, Niswah, Megawati, & Rahaju, 2020)(Gunawan & Sulaeman, 2020).

Based on data on stunting toddlers collected by the World Health Organization (WHO) shows that Indonesia is one of the three countries with the highest prevalence in the Southeast Asia region / South-East Asia Regional (SEAR). The average prevalence of stunting under five in Indonesia from 2005 to 2017 was 36.4 % . In 2017 as many as 22.2% or around 150.8 million children under five in the world experienced stunting of which more than half of stunted children in the world came from Asia (55%) and a third lived in Africa (39%). Of the 86.3 million stunted children under five in Asia, the largest proportion came from South Asia (58.7%) and the least came from Central Asia (0.9%). When compared with the stunting rate in 2000 of 32.6%, it can be said that there has been a decline in stunting because the stunting rate in 2017 was 22.2%. (Ministry of Health RI, 2018).

Data from Unicef about 1 in 4 toddlers is *stunted* (UNICEF, 2013), the prevalence of short toddlers becomes a public health problem if the prevalence is 20% or more because the percentage of stunted toddlers in Indonesia is still high and is a health problem that must be addressed compared to some neighboring countries. short toddlers (16%) and Singapore (4%) (UNSD, 2014). The 2014 *Global Nutrition Report* shows that Indonesia is included in 17 countries, among 117 countries, which have three nutritional problems, namely *stunting* , *wasting* and *overweight* in children under five. Reducing *stunting* or short stature is an

international target for 2025 and is one of the health *outputs of the Sustainable Development Goals (SDGs)*, which is a continuation program of the *Millennium Development Goals (MDGs)*.

Several other impacts that occur due to stunting where children have less intelligence which affect learning achievement are not optimal and productivity decreases. If this continues, it will hinder the development of a nation's productivity in the future. *Stunting* problems that occur in childhood have an impact on morbidity, mortality, impaired physical growth, impaired mental development, cognitive and motor development disorders. Disorders that occur tend to be *irreversible* and affect subsequent developments which can increase the risk of degenerative diseases as adults (Juwita, Arsyad, & Alfando, 2020) (Putra, Nugroho, Julendra, & Fahmi, n.d.) (Kahrilas et al., 1986).

Stunting occurs due to basic causes associated with education, poverty, socio-culture, government policies and politics. The causes of stunting consist of many factors that influence each other and the causes are different in each region (Kwami et al, 2019; Saputri & Tumangger, 2019). Direct causes of stunting *include* inadequate nutritional intake and infectious diseases and indirectly stunting can be caused by factors of family food security, parenting, health services and inadequate environmental health including water and sanitation. (Sulistyanto, Dwinarko, Syafrizal, & Mujab, 2021) (Katyal & Xaviour, 2015) (Keskgn, Ğentürk, Sungur, & Kğrgğ, 2010)

Several factors of poor environmental sanitation including inadequate access to clean water, use of unhealthy latrine facilities and poor hand washing hygiene behavior contribute to an increase in infectious diseases such as diarrhea, *Environmental Enteric Dysfunction (EED)*, intestinal worms. This can cause linear growth disorders and can increase mortality in children under five (Kwami et al., 2019; Headey & Palloni, 2019; Cumming & Cairncross, 2016; BAPPENAS & UNICEF, 2017)

Several studies related to the problem of *stunting* related to complex causes were carried out in various countries, especially in low and middle income countries. The research conducted not only focuses on nutritional problems and infectious diseases as the cause of *stunting*, but also on other supporting factors such as the nutritional adequacy of parents, socioeconomic status of the family. One of the factors that are closely related to *stunting* is water, sanitation and hygiene (Kotler, 2012) (Mutula & van Brakel, 2006) (Setiawati, Purba, Imran, Kusumasari, & Murtadi, 2019) (Mukhtar, Putri, Suseno, Wibowo, & Wardana, 2020)

The prevalence of stunting or the level of malnutrition in children under five in North Sumatra is still relatively high, which is obtained from the results of the Basic Health Research (Riskesdas). In 2019, the prevalence of stunting in North Sumatra reached 30.11% and previously 32.4% in 2018. And there are 15 areas in North Sumatra that are priority stunting prevention. The 15 areas are Medan, Deli Serdang, Langkat, Simalungun, Dairi, Pakpak Bharat, Central Tapanuli, Mandailing Natal, Padang Lawas, North Padang Lawas, Nias, South Nias, West Nias, North Nias, and Gunung Sitoli.

Based on the data above, the author is very interested in conducting research on the determinants of stunting at the Titi Papan Health Center, Mabar Hilir Village, Medan Deli District in 2021.

RESEARCH METHOD

There are 4 factors that influence the degree of human health, namely behavior, health services and heredity as well as environmental factors that play a major role in this. From the environmental aspect, the problem of ownership of healthy latrines and the provision of clean water still needs to be considered (North & Smallbone, 2000)(Nwachukwu & Ogbo, 2012)(Setiawati et al., 2019)(Putra et al., n.d.)(Mukhtar et al., 2020).

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Environmental sanitation problems need to be monitored on environmental factors because they affect human health (Surahman & Poetra, 2022). Activities that can be done in this case are cleaning the house and yard regularly, cleaning bathrooms and toilets, cleaning drains and using clean water (Rahatmawati, Istanto, Wijaya, & Hayati, 2020)(Setiawati et al., 2019)(Sulistiyanto et al., 2021)

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Based on data on stunting toddlers collected by the World Health Organization (WHO) shows that Indonesia is one of the three countries with the highest prevalence in the Southeast Asia region / South-East Asia Regional (SEAR). The average prevalence of stunting under five in Indonesia from 2005 to 2017 was 36.4 % . In 2017 as many as 22.2% or around 150.8 million children under five in the world experienced stunting of which more than half of stunted children in the world came from Asia (55%) and a third lived in Africa (39%). Of the 86.3 million stunted children under five in Asia, the largest proportion came from South Asia (58.7%) and the least came from Central Asia (0.9%). When compared with the stunting rate in 2000 of 32.6%, it can be said that there has been a decline in stunting because the stunting rate in 2017 was 22.2%. (Ministry of Health RI, 2018).

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Several factors of poor environmental sanitation including inadequate access to clean water, use of unhealthy latrine facilities and poor hand washing hygiene behavior contribute to an increase in infectious diseases such as diarrhea, *Environmental Enteric Dysfunction* (*EED*), intestinal worms. This can cause linear growth disorders and can increase mortality in children under five (Kwami et al., 2019; Headey & Palloni, 2019; Cumming & Cairncross, 2016; BAPPENAS & UNICEF, 2017)

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Based on the data above, the author is very interested in conducting research on the determinants of stunting at the Titi Papan Health Center, Mabar Hilir Village, Medan Deli District in 2021.

RESULTS AND DISCUSSION

A. Overview of Research Sites

Titi Papan Health Center is one of the health centers that provides outpatient services. For the community, the Puskesmas is the only health facility or place for treatment provided by the nearest government and at an affordable cost. One of them is the Titi Papan Health Center which is located in the District of Medan Deli, Jalan Platina No. 04, Medan City.

The population under the guidance of the Titi Papan Health Center is 33,065 people, consisting of 16,325 male residents and 16,740 female residents. Titi Papan Health Center has a working area of 1 kelurahan with an area of ± 400.0 H with 16 neighborhoods and 7,989 families which are the working area of Titi Papan Health Center

B. Univariate Analysis

Table 4.1 Distribution of Proportion of Respondents by Gender, Birth Weight, Maternal Age During Pregnancy, Education, Occupation, Family Income, Mother's Height, Availability of Clean Water Facilities, Family Toilet Facilities, Availability of Garbage Disposal Sites and Ownership of Sewerage Channels at Titi Health Center Medan Deli District Board, Medan Municipality in 2021.

No.	Independent Variable	k case		C control	
		F	%	f	%
Gender					
1.	Woman	22	50	20	45.5
2.	Man	22	50	24	54.5
Amount		44	100	44	100
Birth Weight					
	at risk	12	27.3	0	0
1.	No Risk	32	72.7	44	100
2.					
Amount		44	100	60	100
Mother's Age When Pregnant					
1.	at risk	2	4.5	4	9.1
2.	No Risk	42	95.5	40	90.9
Amount		44	100	44	100
Education					
1	Low	18	40.9	4	9.1
2.	Tall	26	59.1	40	90.9
Amount		44	100	60	100
Work					
1.	Doesn't work	36	81.8	31	70.5
2.	B work	8	18.2	13	29.5
Amount		44	100	44	100
Family Income					
	< MSE				
1.	MSE	37	84.1	11	25
2.		7	15.9	33	75
Amount		44	100	44	100

Mother's Height					
	at risk				
1.	No Risk	7	15.9	1	9.1
2.		37	84.1	43	90.9
Amount		44	100	44	100
Availability of Clean Water Facilities					
1.	Not eligible	30	68.2	8	.2
2.	Qualify	14	31.8	36	81.8
Amount		44	100	44	100
Family latrine facilities					
1.	Not eligible	11	25	0	0
	Qualify	33	75	44	100
2.					
Amount		44	100	44	100
Availability of Garbage Disposal					
1.	Not eligible	42	95.5	44	100
2.	Qualify	2	4.5	0	0
Amount		44	100	44	100
Sewerage Ownership					
1.	Not eligible	30	68.2	44	00
	Qualify	14	31.8	0	0
2.					
Amount		44	100	44	100

Based on the results of research on the sex of the respondents that the case and control groups were each as many as 22 people (50%), while in the control group most of the sexes were male, namely as many as 24 people (54.5%).

Birth weight in the case group was mostly not at risk as many as 32 people (72.7%), while in the control group all were not at risk, namely 2.5-4 kg as many as 44 people (100%).

The age of the mother during pregnancy in the case group was mostly between the ages of 20-35 years, as many as 42 people (95.5%), while in the control group most were also aged 20-35 years, as many as 40 people (90.9%).

The nutritional status of children under five in the case group was mostly normal, as many as 27 people (91.7%), while in the control group, most of them were normal, as many as 52 people (86.7%).

Mother's education in the case group was mostly highly educated , namely > high school and above as many as 26 people (59.1%), while in the control group most of them were also highly educated, namely 40 people (90.9%).

Most of the mothers under five in the case group did not work as many as 36 people (81.8%), while in the control group most of them also did not work, as many as 31 people (70.5%).

Family income in the case group was mostly below the minimum wage for North Sumatra, namely < Rp.3.222,556, namely 37 people (84.1%), while in the control group mostly Rp.3.222,556, namely 33 people (75%) .

mother's height in the case group was mostly > 150 cm as many as 37 people (84.1%), while in the control group most were also > 150 cm as many as 43 people (97.7%).

clean water sources in the case group mostly did not meet the requirements, namely 30 people (68.2%), while in the control group most of them met the requirements, namely 50 people (56.8%).

Family latrine facilities in the case group mostly met the requirements, namely 33 people (75%), while in the control group, most of them also met the requirements, namely 44 people (100%).

The availability of waste disposal sites in the case group mostly did not meet the requirements, namely 42 people (95.5%), while in the control group, most of them also did not meet the requirements, namely 44 people (100%).

Availability of Wastewater Sewerage in the case group mostly did not meet the requirements, namely 30 people (68.2%), while in the control group most of them also did not meet the requirements, namely 44 people (100%).

C. Univariate Analysis

Table 4.2 Cross-tabulation of the Influence of Gender, Birth Weight, Maternal Age During Pregnancy, Education, Occupation, Family Income, Mother's Height, Availability of Clean Water Facilities, Family Toilet Facilities, Availability of Garbage Disposal Sites and Ownership of Sewerage Channels in Stunting Incidents at Titi Papan Health Center, Medan Deli District, Medan Municipality in 2021

Risk Factor	Stunting Incident		p.value	1.1 OR (95% CI)
	k case	C control		
	f	%	f	%
Gender				
Woman	22	50	20	45.5
Man	22	50	24	54.5
Amount	44	100	44	100
Birth Weight				
at risk	12	27.3	0	0
No Risk	32	72.7	44	100
Amount	44	100	60	100

Mother's Age						
When Pregnant at risk	2	4,595.5	4	9.1	.672	0.476 (0.083-2.745)
No Risk	42		40	0.9		
Amount	44	100	44	100		
Education						
Low	18	40.9	4	9.1	0.001	6,923 (2.105-22.771)
Tall	26	59.1	40	0.9		
Amount	44	100	60	100		
Work						
Doesn't work	36	81.8	31	70.5	0.317	1,887 (0.692-5,146)
B work	8	18.2	13	29.5		
Amount	44	100	44	100		
Family Income						
< UMR					0.000	15,857 (5,508-45,654)
UMR	37	84.1	11	25		
Amount	44	100	44	100		
Mother's Height						
at risk	7	15.9	1	9.1	0.064	8.135 (0.956-69.205)
No Risk	37	84.1	43	0.9		
Amount	44	100	44	00		
The Presence of Clean Water Sources						
Not eligible	30	68.2	8	8.2	0.000	9,643 (3,566-26,072)
Qualify	14	31.8	36	81.8		
Amount	44	100	44	100		
Family latrine facilities						
Not eligible	11		25	0	0.001	2,333 (1,803-3,020)
Qualify	33		75	44		
Amount	44	100	44	00		
Availability of Garbage Disposal						
Not eligible					0.474	0.488 (0.393-0.606)
Qualify	42	95.5	44	00 0		
Amount	44	100	44	00		

Sewerage Ownership						
Not eligible						
Qualify	30	68.2	44	00	,000	0.405 (0.308- 0.534)
	14	31.8	0	0		
Amount	44	100	44	00		

D. **Table 4.3** Results of the First Stage of Double Logistics Regression Test that will enter In Model

No	Variable	pValue	Description
1	Gender	0.670	Not Candidate
2	Birth Weight	0.999	Not Candidate
3	Mother's Age When Pregnant	0.406	Not Candidate
4	Education	0.001	Candidate
5	Work	0.215	Candidate
6	Family Income	0.000	Candidate
7	Mother's Height	0.055	Not Candidate
8	Availability of clean water facilities	0.000	Candidate
9	Family latrine facilities	0.999	Not Candidate
10	Availability of Garbage Disposal	0.999	Not Candidate
11	Ownership of Sewerage	0.998	Not Candidate

Based on the final stage modeling, to see the most dominant variable on the incidence of stunting with the largest OR is the family income variable where the OR is 9.208 and the confounding variable is Education and Work because p value > 0.05

DISCUSSION

Gender has no effect on the incidence of stunting with a probability value (p) = 0.831. The *Odds Ratio* (OR) value is 1,200 (95% CI; 0,519-2,773) meaning that toddlers suffer from stunting 1,200 times greater for female than male.

Boys get sick more often than girls but it's not clear why this is. In traditional societies, girls clearly have a lower status than boys so that infant mortality and malnutrition are still high in women (Soetjningsih *in* Fitri, 2012). According to the Cohort Study in Ethiopia, male infants have a double risk of becoming stunted compared to female infants at the age of 6-12 months (Medhin *in* Anisa 2012). The results of research from Bosvh, Baqui & Ginneken, (2008) are that the probability of stunting in adolescence for girls is about 0.4 times the probability for boys, which means that girls in adolescence are slightly more stunted than boys. man. Girls enter puberty two years earlier than boys, their growth stops at least two years earlier than boys, and two years is also the difference in peak speed between the two sexes (Fitri, 2012) . Based on the results of Nadiyah's research (2014) Gender, boys are more likely to experience stunting (35.7%) than girls (31.6%). According to Adriana (2012) in general, men need more energy than women.

The prevalence of LBW at the population level is an indicator of public health problems which include long-term maternal nutrition problems, illness, heavy workload

and inadequate prenatal care. Although until now there is no limit for the prevalence of LBW at the population level, LBW is still a public health problem in many countries, because it is considered to be one of the factors causing infant mortality. Populations with a high percentage of LBW often have a high IMR (Wilcox, 2001).

Birth weight in the case group was mostly not at risk as many as 32 people (72.7%), while in the control group all were not at risk, namely 2.5-4 kg as many as 44 people (100%).

Toddler birth weight has an effect on the incidence of stunting with a probability value (p) = 0.001. The *Odds Ratio* (OR) value is 2.375 (95% CI; 1.825-3.091), meaning that toddlers suffer from stunting 2.375 times greater with body weight < 2.5 kg years compared to body weight 2.5-4 kg.

Maternal age has no effect on the incidence of stunting with a probability value (p) = 0.672. The *Odds Ratio* (OR) value is 0.476 (95% CI; 0.083-2.745) meaning that toddlers suffer from stunting 0.476 times greater with maternal age <20 and > 35 years compared to maternal age 20-35 years.

Age is one of the factors used to predict differences in terms of diseases, conditions and health events (Widyastuti, 2005).

This study is in line with the findings of Astuti (2016) that there is no relationship between maternal age and the incidence of *stunting*, this is because maternal age is considered more of a role as a psychological factor for mothers such as acceptance of child pregnancy so that it affects child care patterns, in this case feeding parenting. This is in line with Candra in Astuti (2016) which states that the physiological factors of maternal age affect fetal growth but the intake of balanced food that is digested by the mother can have a positive impact.

Mother's education has an effect on the incidence of stunting with a probability value (p) = 0.001. The value of the *Odds Ratio* (OR) is 6.923 (95% CI; 2.105-22.771), meaning that toddlers suffer from stunting 6.923 times greater with low maternal education compared to high maternal education.

Mother's education is a very important factor. Mother's level of education is closely related to the level of knowledge of health care, pregnancy and postpartum, as well as awareness of the health and nutrition of children and their families. And can determine whether or not someone easily absorbs and understands the nutritional knowledge that has been obtained (Daming et al., 2019)

Respondents with the characteristics of low income, low education and low level of knowledge in meeting the nutritional needs of children are the enabling factors for *stunting*. Low maternal knowledge coupled with low family income is the dominant factor in the incidence of *stunting*. The incidence of *stunting* by these factors causes the main family of the mother to pay less attention to the nutritional needs of the child, as a result the nutritional needs are not met, resulting in growth failure of the toddler and *stunting occurs*.

The work of the mother under five has no effect on the incidence of stunting with a probability value (p) = 0.317. The value of the *Odds Ratio* (OR) is 1.887 (95% CI; 0.692-5.146) meaning that toddlers suffer from stunting 1.887 times greater with mothers who do not work compared to working mothers.

The results of this study are in line with research by Anisa (2012) where it is said that mother's work is not related to the incidence of *stunting* in toddlers. This can be because working mothers can help in terms of the economy so as to increase purchasing power for children's nutritional intake. Although the time to care for children is less than mothers who do not work. When researchers went to the field, it was found that working mothers left their children with their parents and the parents did not provide enough care

for their grandchildren and added to the very poor sanitation conditions due to the condition of the house, dirty bathrooms, lots of garbage behind the house and the house on the road. which is very risky to breathe dirty air because of the many passing vehicles.

Toddler family income has an effect on the incidence of stunting with a probability value (p) = 0.000. The *Odds Ratio* (OR) value is 15,857 (95% CI; 05,508-45,654), meaning that children under five suffer from stunting 15,875 times greater with income below the UMK (Rp. < 3,222.556) compared to family income UMK.

The socioeconomic status of the family can be seen from the income of a family. Respondents who have *stunting toddlers* mostly earn income in the low category, so some respondents assume that the income they get is still very less to be able to meet their daily needs. Mothers prefer cheap food products to give to their toddlers. They also do not care about the nutritional content contained in every food product they buy so that the food consumed does not have sufficient nutrition for the growth and development of their children (Daming *et al.* , 2019).

In another study, stunting was also found in families with prosperous socioeconomic status. This is in line with the study by Nurmayasanti (2019); Fikrina (2017); Ngaisyah (2019) which states that apart from low-income families, stunting is also found in high-income families, but the proportion is lower than low-income families.

This study said that the socioeconomic status of *stunting families* was found . Most of the studies revealed that the economic status of the families of stunting toddlers was in the low category. The characteristics of parents of toddlers who mostly have low education (Nurmayasanti, 2019; Fikrina, 2017; Wahyuni & Fitrayuna, 2020; Ngaisyah, 2015 Divine, 2017; Dalimunte, 2015; Winasis, 2018) have an impact on working conditions, most of whom work in the private sector. as casual daily laborers and mothers who only work as housewives (Wahyuni & Fitrayuna, 2020; Ngaisyah, 2015) are enabling factors for the low family income of these stunting toddlers.

Low socioeconomic status is a risk factor for *stunting* in children under five. Family income is related to the ability of the household to meet the needs of life, both primary, secondary, and tertiary. High family income makes it easier to meet the necessities of life, on the contrary, low family income understands the difficulties in meeting the necessities of life. Low income will affect the quality and quantity of food consumed by the family. The food obtained will usually be less varied and in small quantities, especially in foods that function for the growth of children, sources of protein, vitamins, and minerals, thereby increasing the risk of malnutrition.

Mother's height has no effect on the incidence of stunting with a probability value (p) = 0.064. The *Odds Ratio* (OR) value is 8.135 (95% CI; 0.956-69.205) meaning that toddlers suffer from stunting 8.135 times greater with a height less than or equal to 150 cm compared to a mother's height of more than 150 cm.

The finding that the child's height has a significant relationship with the mother's height (Hartati, 2011). The finding that height is closely related to productivity and final height is determined by nutrition from conception to age two. Lack of height as an adult is the result of childhood stunting which is associated with a loss of productivity of 1.4% (Nadiyah, 2014). About the 2013 Nutrition Adequacy Rate (RDA) Stunting children from mothers whose height is <155 cm are more than stunting children from mothers whose height is 155 cm (Hafid, 2016). Research from Hanum (2014) which says that stunting children (74.5 %) have more short mothers than normal children (60.5%). The findings from Lestari (2014) state that children born to short mothers have an 11.13 times risk of becoming stunted compared to children born to parents of normal height. This study is not in line with the results stated by other researchers that having a short mother is a risk factor for stunting. Stunting tends to be inherited, so it is thought to have a genetic cause.

Family members not only share genes, but also lack of food intake that can encourage stunting. (Adriani, 2012). Children become short mostly because children get a lack of parenting in terms of feeding practices (Lestari, 2014)

The existence of good and proper drinking water sources is protected drinking water including tap water (taps), public hydrants, public taps, terminal PAH water, or protected springs and wells, drilled wells or pumps, with a minimum distance of 10 meters from sewage disposal, waste collection and waste disposal. This does not include bottled water, water sold through tanks, water from mobile vendors, well water and unprotected springs (Kemenkes RI, 2018b).

The existence of clean water sources affects the incidence of stunting with a probability value (p) = 0.000. The *Odds Ratio* (OR) value is 9.643 (95% CI; 3.566-26.072), meaning that toddlers suffer from stunting 9.643 times greater with the presence of clean water sources that do not meet the requirements compared to the presence of clean water sources that meet the requirements.

This is in line with research which states that there is a significant relationship between the availability of clean water sources and the incidence of *stunting*. Families that do not have access to clean water are at a significantly higher risk of 3 times suffering from *stunting* when compared to families who have access to clean water (Ahmad & Indah, 2019).

Research conducted by several studies, namely the evidence found in Indonesia, has similarities with findings from abroad which reveal that unimproved water increases the incidence of stunting in children under five. One of the Ethiopian findings revealed that drinking water sources are associated with stunting in children under five (Kwami., et al, 2019).

We know that latrines that do not meet standards will trigger infectious diseases due to poor *hygiene* and sanitation so that they can inhibit the absorption of nutrients in the digestive tract (Kemenkes RI, 2018b)

Family latrine facilities affect the incidence of stunting with a probability value (p) = 0.001. The value of the *Odds Ratio* (OR) is 2,333 (95% CI; 1,803-3,020) meaning that toddlers suffer from stunting 2,333 times greater with family latrine facilities that do not meet the requirements compared to family latrine facilities that meet the requirements.

This result is in line with the results of Nasrul's research (2018) which states that there is a significant relationship between improper latrine ownership and the incidence of *stunting*. Toddlers with inadequate latrine ownership are at risk of *stunting* 7,398 times higher than toddlers with proper latrine ownership.

Several studies, namely most of the findings in Rural Indonesia related to sanitation using latrine facilities ranging from latrine ownership, types of latrines, latrines not using septic tanks, latrine hygiene, Open defecation behavior and disposal of under-five feces not in latrines were associated with an increase in stunting in children under five in Indonesia. Indonesia (Ahmadi et al., 2020; Badriyah & Syafiq, 2017; Choirunnisa et al., 2020; Dwipayanti et al., 2020; Fikru & Doorslaer, 2019; Hasanah & Susanti., 2018; ; Hafid., et al., 2017 ; Hasan & Kadarusman., 2018; Herawati et al., 2020; Nasrul, 2018; Otsuka et al., 2019; Rahayu et al., 2017; Rahayu et al., 2018; Lobo et al, 2020; Siswati, 2018; Torlesse et al., 2016; Wiyono et al., 2019; Cahyono et al., 2016; Rahayu and Darmawan, 2019; Zairinayati & Purnama, 2019).

The results of this study are in line with the research of Fregonese et al., (2016), which states that children living in an environment contaminated with inadequate sanitation have a 40% risk of stunting and are significantly higher in rural and suburban areas (43% vs 27%). compared to those living in urban areas (5%). An analysis in India

proves that the incidence of stunting is highest in children living in rural areas because most people still practice open defecation (Chakravarty et al, 2017).

availability of waste disposal sites has no effect on the incidence of stunting with a probability value (p) = 0.474. The *Odds Ratio* (OR) value is 0.488 (95% CI; 0.393-0.606) meaning that toddlers suffer from stunting 0.488 times greater with the availability of waste disposal sites that do not meet the requirements compared to the availability of eligible waste disposal.

Garbage is a source of disease and a breeding ground for disease vectors such as flies, mosquitoes, rats, cockroaches etc. In addition, garbage can pollute the soil and cause comfort and aesthetic disturbances such as unpleasant odors and unsightly views.

The existence of sources of infection that can cause waste disposal facilities, namely through insects or flies that land on open food can be prevented because most of the people in the Titi Papan Health Center, Mabar Hilir Subdistrict, Medan Deli District cover their food with a serving hood, so in this study it is said not to be there is a significant relationship between waste disposal facilities and the incidence of stunting in children under two.

Based on the observations of researchers that the average community does not have a garbage collection place at home that meets the requirements where the waste is first stockpiled and then disposed of in a temporary waste disposal site and transported regularly by janitors and some are dumped in a garbage pit, and some burn garbage and there are also those who throw garbage into the ditch so that in the ditch there are flies and other vectors of disease in the form of mosquitoes.

The availability of sewerage affects the incidence of stunting with a probability value (p) = 0.000. The *Odds Ratio* (OR) value is 0.405 (95% CI; 0.308-0.534) meaning that toddlers suffer from stunting 0.405 times greater with Availability of sewers that do not meet the requirements compared to Availability of sewers that meet the requirements.

finding is in line with research conducted in the work area of the Cibeureum Health Center, Tasikmalaya City which showed that there was a significant relationship between the availability of household wastewater disposal sanitation facilities and the incidence of stunting in children under five, households that had household wastewater disposal sanitation facilities that did not meet the requirements. 3,124 times more risky than household sanitation facilities that meet the requirements (Ramadan, 2019). Bad sewerage can be a breeding ground for disease because animals such as insects can live in dirty places where there is standing water, so that they can pollute the environment and trigger various environmental-based diseases, one of which is stunting.

Disposal Facilities have an effect on the incidence of stunting with a probability value (p) = 0.027. The value of the *Odds Ratio* (OR) is 2.286 (95% CI; 1.092-4.783), meaning that toddlers suffer from diarrhea 2.286 times greater than those with waste water disposal facilities that do not meet the requirements.

Based on the observations of researchers that the waste water disposal facilities are still very lacking, there are still many residents who do not have waste disposal facilities and if there is a waste water disposal channel, the average wastewater disposal channel is open and the water is stagnant and in the ditch there is a lot of garbage so that if it rains it often results in as a result of flooding but some also have a closed sewer t.

CONCLUSION

The factors that significantly influence _ Significantly the incidence of stunting was birth weight (p = 0.001, OR = 2.375), education (p = 0.001, OR = 6.923), family income (p = 0.000, OR = 15.857), availability of clean water facilities (p = 0.000, OR = 9.643), family latrine facilities (p = 0.001, OR =

2.333), ownership of sewerage ($p = 0.000$, OR = 0.405) AND the results of the Multivariate Test found that one variable that had the most influence on the incidence of stunting was family income ($p = 0,000$, Exp (B) = 9,208. where low income or low family income will affect the quality and quantity of food consumed by the family. The food obtained will usually be less varied and in small quantity, especially in foodstuffs that function for the growth of children. protein, vitamins, and minerals, thereby increasing the risk of malnutrition.

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