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The Dominant Factors of Stunting Incidence in Toddlers (0 – 59 Months) in East Lombok Regency A *Riskesdas* Data Analysis 2018

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Abstract:- Stunting is a short stature in toddlers which reflects a process of failure to achieve linear growth potential which is still a severe nutritional status problem in Indonesia. The stunting rate in East Lombok Regency (43.52%) in 2018 was higher than the stunting rate of NTB Province (33.5%) and National (30.8%). This study aims to determine the dominant factor in Stunting Incidence in Toddlers (0 – 59 Months) in East Lombok Regency. This quantitative study used a cross-sectional design and utilized secondary data from *Riskesdas* (Baseline Health Research) 2018 with a total sample of 283 aged 0 – 59 months. Data were analyzed using the chi-square test and multiple logistic regression. The results of this study showed that there were 43.1% of children under five were stunted. The results of the bivariate analysis stated that there was a significant relationship between the birth weight of toddlers, height, and mother's last education, but there was no positive correlation between stunting and gender, bowel habits, history of diarrhea, history of ARI, basic immunization, vitamin A consumption, work status mother, father's smoking habit, number of household members, number of children under five, BMI, ownership of MCH book, ANC, exclusive breastfeeding, area of residence, and access time to the *Puskesmas* (public health center). The dominant factor for stunting in toddlers (0 – 59 months) in East Lombok Regency, namely birth weight (OR = 3,206). The conclusion of this study is that toddlers who have a birth weight of <3000 grams have a risk of 3,206 times of experiencing stunting.

Keywords:- *Stunting, Birth Weight, Toddlers, East Lombok***.**

I. INTRODUCTION

Nowadays the incidence of stunting remains the focus of public health nutrition problems, more so in developing countries. Stunting is a condition of short stature in toddlers, which reflects a process of failure to thrive in achieving linear growth due to health and nutritional conditions (WHO, 2020). In the Health Data and Information Window Bulletin (*Buletin Jendela Data dan Informasi Kesehatan*) of the Indonesian Ministry of Health (2018), the definition of stunting is presented as a condition when the length/height is less than their peers. The stunting rate in Indonesia based on UNICEF, WHO, and World Bank 2017 data, when compared to other countries, Indonesia (27.5%) occupies the top position compared to Vietnam (23.8%), Malaysia (20.7%), Thailand (10.5%), and Singapore (4%). This is also evidenced in the 2018 *Riskesdas* data and the Director General of Public Health of the Indonesian Ministry of Health in the 2019 SSGBI (Study of the Nutritional Status of Indonesian Toddlers). The proportion of stunted toddlers in Indonesia has continued to increase from 2016 to 2018, 27.5% respectively; 29.6%; and 30.8% (7 million under five).

It is known that 45% of child deaths under the age of 5 years are caused by malnutrition with stunting being the biggest contributor [1,2]. This is caused by stunting increasing the risk of mortality and morbidity because it causes a weakening of the immune system, susceptibility to disease, especially infectious diseases, metabolic disorders, not being able to grow and develop according to the child's age, decreased productivity, low cognitive development so that learning abilities are not optimal and difficulty competing, as well as malabsorption of nutrients [2,3,4]. When adults with stunting experience difficulties in competing in the world of work and are at risk of developing non-communicable diseases such as diabetes mellitus, coronary heart disease, stroke, and hypertension [5,6,7]

In the process of growth and development, stunting in children under five can be caused by a disturbance in the endocrine system, in which the disorder reduces the amount of growth hormone released. The relationship between the endocrine system and growth, namely there is a pituitary gland that controls growth hormone. The pituitary gland itself or the pituitary gland consists of anterior and posterior lobes. The anterior lobe, also known as the adenohypophysis, is responsible for releasing hormones that are responsible for human growth and development. The hormones produced include growth hormone (GH), thyroid stimulating hormone (TSH), prolactin, gonadotropins (Luteinizing), and adrenocorticotropic hormone (ACTH). Growth hormone produces growth factor IGF-1 from the liver, which directly affects skeletal muscle fibers and cartilage cells to increase the uptake of amino acids and incorporate them into new proteins [8]. IGF-1 will affect bone growth by stimulating the proliferation and differentiation of chondrocytes in the epiphyseal growth plate and directly affecting osteoblasts. When children experience a lack of protein intake for a long time, even though their energy intake is sufficient, this can still hinder their growth in height [9].

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Stunting is a complex and multidimensional problem because it concerned with individuals, households, communities, nationally and the environment [7]. One of the risk factors found to be a cause of stunting is the baby's birth weight. A study conducted in Zimbabwe found that babies born with LBW experienced growth and development retardation compared to babies born normally [10]. Research conducted by Lestari, Hasanah and Nugroho (2018) also found a significant relationship between LBW and the incidence of stunting in toddlers [11]. The research shows that babies born with LBW are 12.4 times at risk of being affected by stunting. Other stunting risk factors discussed in this study were the sex of the toddler, history of diarrhea, ISPA, bowel habit, immunization, Vitamin A administration, mother's height, mother's education, mother's employment status, father's smoking habit, number of family members, number of children under five in the family, Early Initiation of Breastfeeding (IMD), History of Exclusive Breastfeeding, Ownership of MCH Handbook, Antenatal Care (ANC), Region of residence, Travel time to Health Center, and Source of drinking water for research respondents.

Based on the problems previously described, researchers were encouraged to find out the dominant factors in the incidence of stunting in toddlers (0 – 59 months) in East Lombok Regency by analyzing the 2018 *Riskesdas* data. The choice of East Lombok Regency as a research location was due to the high stunting rate exceeding the province's stunting average. NTB and even National. In the 2018 NTB Province *Riskesdas* results report, the stunting rate in East Lombok Regency was 43.52% while the NTB Province was 33.5% and the National was 30.8%. Although previously there have been many studies related to stunting risk factors, not much has discussed the dominant factors that cause stunting in toddlers in East Lombok (Lotim) Regency. With this research, the researchers hope to be able to provide information for the community in general and become a consideration for the government in making policies that are right on target so that the stunting rate in the people of East Lombok is reduced.

II. METHODOLOGY

This research is a quantitative study with a cross-sectional study design that uses 2018 *Riskesdas* data to look at the dominant factors in stunting in toddlers aged 0-59 months in East Lombok district. The population in this study, namely all mothers who have toddlers aged 0-59 months in East Lombok Regency, West Nusa Tenggara in 2018 who are respondents to the 2018 *Riskesdas*. The time of carrying out this research took place from March to June 2022. The number of samples obtained from the 2018 *Riskesdas* data, there were 283 respondents. Next, the data were analyzed univariately to see an overview of each variable, then bivariately analyzed to see the relationship between the independent and dependent variables, and finally analyzed multivariately to see the dominant factor of stunting. This research has received an ethical review pass letter from the Public Health Research and Service Ethics Commission, Faculty of Public Health, University of Indonesia with letter number - 72 /UN2.F10. D11/PPM.00.02/2022.

III. RESULTS

Based on table 1 the results of the distribution of stunting in toddlers (0 – 59 months) in East Lombok Regency in 2018, toddlers with stunting status are 42.7% with details of severe stunting of 12.7% and stunting of 30.0%. While toddlers who have normal nutritional status are 57.3% with details of those who have a value of -2 to -1.01 SD of 29.0% and those who have a value of SD > -1 SD of 28.3%.

Variable	Total (n)	Percentage (%)
Stunting	**111**	**42.7**
Severe Stunting	36	12.7
Stunting	85	30.4
Normal	**162**	**57.3**
-2 sd -1.01 SD	82	29.0
> -1 SD	80	28.3
Total	**283**	**100.0**

Table 1 Distribution of Stunting in Toddlers (0 – 59 months) in East Lombok Regency in 2018

Based on table 2, it is known that the respondents in this study consisted of 47.3% male toddlers and 52.7% female toddlers. 13.4% of toddlers had a history of diarrhea and 86.6% did not have a history of diarrhea. Then, the percentage of children under five who had a history of ARI was 8.5% and those who did not have a history of ARI was 91.5%. Immunization completeness data shows that more respondents did not receive complete basic immunization, namely 86.1% compared to those who fulfilled complete basic immunization, amounting to 13.9%. The consumption rate of vitamin A for respondents was quite good, namely 86.5%, compared to those who did not consume vitamin A, which was 13.5%.

Variable	Category	Total (n)	Percentage (%)
Gender (n=283)	Male	134	47.3
	Female	149	52.7
Diarrhea History (n=283)	Yes	28	13.4
	No	245	86.6
ARI History (n=283)	Yes	24	8.5
	No	259	91.5
Immunization (n=187)	Incomplete	161	86.1
	Complete	26	13.9
Vit. A Consumption (n=277)	Yes	36	13.5
	No	230	86.5
Mother's Height (cm)	Short (≤145cm)	35	14.1

ISSN No:-2456-2165

Variable	Category	Total (n)	Percentage (%)
(n=249)	Height (>145cm)	214	85.9
Birth weight (n=183)	<3000g	49	27.8
	<2500g	9	5.1
	2500 - <3000g	40	22.7
	≥3000g	127	72.2
Mother's Education (n=249)	≤Elementary school	93	37.3
	Junior & Senior	129	51.8
	Diploma/University	27	10.8
Mother's Employment Status (n=249)	Employed	117	47.0
	Unemployed	132	53.0
Father's smoking Habit (n=249)	Smoking	171	91.0
	No	17	9.0
Family Member (n=283)	≥4 Member	190	67.1
	<4 Member	93	32.9
Number of toddlers in family (n=283)	>1 toddlers	35	12.4
	1 toddler	248	87.6
MCH Book Ownership (n=283)	No	75	26.5
	Yes	208	73.5
Antenatal Care (ANC) (n=247)	Not standard	47	19
	Standard	200	81
Early Initiation of Breastfeeding (n=118)	No	50	42.4
	Yes	68	57.6
Exclusive breastfeeding (n=113)	No	36	31.9
	Yes	77	68.1
Residence (n=283)	Village	135	47.7
	City	148	52.3
Access Time to *Puskesmas* (n=282)	>10 Minutes	92	30.1
	≤10 Minutes	202	69.9
Drinking Water Source (n=283)	Not suitable	48	15.9
	Suitable	247	84.1
Bowel Habit (n=283)	Randomly	147	51.9
	Good	136	48.1

Table 2 Frequency Distribution of Independent Research Variables

J From the data contained in table 2, most toddlers have tall mothers, namely 85.9% and 14.1% short mothers. Then, most toddlers born weighing > 3000 grams were 72.2% and those <3000 grams were 27.8%, with details of toddlers born weighing <2500g or low birth weight as much as 5.1% and those born weighing 2500 - <3000g as many as 22.7%. It is known that the average birth weight of toddlers is 3116.4 grams, with a minimum value of 1500 grams and a maximum of 4600 grams. The median value of under-fives' birth weight in this study was 3100 with a variation of 459.5. The mother's education variable, which consisted of not/never attending and not graduating from elementary school public/private school, was found to be 37.3%, junior high and high school as much as 51.8%, while tertiary education was 10.8%. Meanwhile, the respondents' mothers who did not work and worked respectively 53% and 47%. The frequency of the smoking category in the variable father's smoking habit was more (91%) than non-smokers (9%). For the number of household members in the category of many or more than four family members, the frequency is 67.1%, while the number of household members is small, namely 32.9%. Then for the variable number of toddlers in one family, it is known that families who have more than one toddler been 12.4%, while those who have only one toddler been 87.6%.

In the variable of ownership of the MCH book, most respondents already had the MCH book by 73.5% and those who did not owned it were 26.5%. The distribution of frequencies that carried out ANC inspection according to the standard was 81% and the rest were still not in accordance with the standard, amounting to 19%. In the IMD variable, most respondents got IMD (57.6%) compared to those who did not get IMD (42.4%). Based on the data in table 2, there were more respondents who received exclusive breastfeeding, amounting to 68.1%, compared to those who were not exclusively breastfeeding, amounting to 31.9%.

Meanwhile, the distribution of data on respondents' residential areas was more in urban areas (52.3%) than in rural areas (47.7%). In addition to these data, there is a variable travel time to the *puskesmas* which is divided into >10 minutes and <10 minutes, with respective percentages of 30.1% and 69.9%. The results of the univariate analysis of drinking water sources used by respondents daily, including 26.8% of respondents still consume drinking water that is not suitable for consumption, while the remaining 73.2% have consumed drinking water from proper sources. Not only that, from the results of the analysis above, it is known that most respondents

have open defecation habits of 51.5% and the rest have good bowel habits.

ISSN No:-2456-2165

Variable	Stunting				Total		OR (95% CI)	P-value
	Yes		No					
	n	%	n	%	n	%		
Gender								
Male	58	43.3	76	56.7	134	100	1.01 (0.63 – 1.62)	1.000
Female	64	43.0	85	57.0	149	100		
Total	**122**	**43.1**	**161**	**56.9**	**283**	**100**		
Total of child								
>1 toddlers	14	40.0	21	60.0	35	100	0.86 (0.420 – 1.778)	0.830
1 toddler	108	43.5	140	56.5	248	100		
Total	**122**	**43.1**	**161**	**56.9**	**283**	**100**		
Diarrhea History								
Yes	20	52.6	18	47.4	38	100	1.56 (0.785 – 3.092)	0.272
No	102	41.6	143	58.4	245	100		
Total	**122**	**43.1**	**161**	**56.9**	**283**	**100**		
ARI History								
Yes	8	33.3	16	66.7	24	100	0.64 (0.263 – 1.539)	0.426
No	114	44.0	145	56.0	259	100		
Total	**122**	**43.1**	**161**	**56.9**	**283**	**100**		
Immunization								
Incomplete	65	40.4	96	59.6	161	100	0.68 (0.295 – 1.554)	0.478
Complete	13	50.0	13	50.0	26	100		
Total	**78**	**41.7**	**109**	**58.3**	**187**	**100**		
Vit. A Consumption								
No	16	44.4	20	55.6	36	100	0.97 (0.478 – 1.965)	1.000
Yes	104	45.2	126	54.8	230	100		
Total	**120**	**45.1**	**146**	**54.9**	**266**	**100**		
Birth Weight								
<3000gram	27	55.1	22	44.9	49	100	2.67 (1.358 – 5.248)	0.007*
>3000gram	40	31.5	87	68.5	127	100		
Total	**67**	**38.1**	**109**	**61.9**	**176**	**100**		
Mother's Height								
Short	21	60.0	14	40.0	102	100	2.42 (1.163 – 5.012)	0.026*
Height	82	38.3	132	61.7	147	100		
Total	**67**	**38.1**	**109**	**61.9**	**176**	**100**		
Mother's Education								
≤Elementary school	46	49.5	47	50.5	93	100	0.18 (0.057 – 0.554)	0.003*
Junior & Senior	53	41.1	76	58.9	129	100	0.25 (0.082 – 0.763)	0.015*
Diploma/University	4	14.8	23	85.2	27	100	1	
Total	**103**	**41.4**	**146**	**58.6**	**249**	**100**		
Mother's Employment Status								
Employed	54	46.2	63	53.8	117	100	1.45 (0.875 – 2.410)	0.188
Unemployed	49	37.1	83	62.9	132	100		
Total	**103**	**41.4**	**146**	**58.6**	**249**	100		
Father's Smoking Habit								
Yes	78	45.6	93	54.4	171	100	1.54 (0.544 – 4.347)	0.575
No	6	35.3	11	64.7	17	100		
Total	**84**	**44.7**	**104**	**55.3**	**188**	**100**		
Family Number								
>4 members	84	44.2	106	55.8	190	100	1.15 (0.694 – 1.897)	0.684
<4 member	38	40.9	55	59.1	93	100		
Total	**122**	**43.1**	**161**	**56.9**	**283**	**100**		
MCH Book Ownership								
No	35	46.7	40	53.5	75	100	1.22 (0.716 – 2.069)	0.555
Yes	87	41.8	121	58.2	208	100		
Total	**122**	**43.1**	**161**	**56.9**	**283**	**100**		
ANC								
Not Standard	16	34.0	31	66.0	47	100	0.67 (0.345 – 1.303)	0.308

ISSN No:-2456-2165

Variable	Stunting				Total		OR (95% CI)	P-value
	Yes		No					
	n	%	n	%	n	%		
Standard	87	43.5	113	56.5	200	100		
Total	**103**	**41.7**	**144**	**58.3**	**247**	**100**		
Early Initiation Breastfeeding								
No	22	32.4	46	67.6	68	100	1.12 (0.507 – 2.459)	0.943
Yes	15	30.0	35	70.0	50	100		
Total	**37**	**31.4**	**81**	**68.6**	**118**	100		
Exclusive breastfeeding								
No	11	30.6	25	69.4	36	100	0.92 (0.389 – 2.151)	1.000
Yes	25	32.5	52	67.5	77	100		
Total	**36**	**31.9**	**77**	**68.1**	**113**	**100**		
Bowel Habit								
Randomly	65	44.2	82	55.8	147	100	1.10 (0.686 – 1.760)	0.786
Good	57	41.9	79	58.1	136	100		
Total	**122**	**43.1**	**161**	**56.9**	**283**	100		
Residence								
Village	64	43.2	84	56.8	148	100	1.01 (0.632 – 1.620)	1.000
City	58	43.0	77	57.0	135	100		
Total	**122**	**43.1**	**161**	**56.9**	**283**	**100**		
Access time to *Puskesmas*								
>10 minutes	39	45.9	46	54.1	85	100	1.19 (0.712 – 1.984),	0.595
<10 minutes	82	41.6	115	58.4	197	100		
Total	**121**	**42.9**	**161**	**57.1**	**282**	**100**		
Drinking Water Source								
Not suitable	17	37.8	28	62.2	45	100	0.77 (0.400 – 1.480)	0.533
Suitable	105	44.1	133	55.9	238	100		
Total	**122**	**43.1**	**161**	**56.9**	**283**	**100**		

Table 3 The Relationship between Research Variables and Stunting in Toddlers (0 – 59 months) in East Lombok Regency

Based on table 3, the results of the analysis of the relationship between the characteristics of toddlers, namely gender and the incidence of stunting. The percentage of stunted male toddlers is more the same as female toddlers, namely 43.3% and 43.0% respectively. The results of the chi square test show a p value of 1,000, meaning that there is no difference in proportion or no significant relationship between the sex factor and the incidence of stunting in toddlers (0-59 months) in East Lombok Regency in 2018. The OR value shows the number 1.01 (95 % CI: 0.63 – 1.62), which means that male toddlers have a 1,014 times greater risk of experiencing stunting than female toddlers.

In addition, it was found that 40% of stunted toddlers were in the category of >1 toddler in one family, while in the one toddler category it was 43.5%. The results of the chi square test show a p value of 0.830, which means there is no difference in proportion or no significant relationship between the number of children under five in the family and the incidence of stunting in children under five (0-59 months) in East Lombok Regency in 2018. The OR value is obtained by 0.86 (95% CI: 0.420 – 1.778) indicates that variable 1 toddler has a protective factor for experiencing stunting.

Most cases of stunting in toddlers occur in toddlers with a history of diarrhea, amounting to 52.6% compared to toddlers who don't have a history of diarrhea, amounting to 41.6%, based on table 5.10. The p value from the results of the chi square test, which is 0.272, means that there is no significant relationship between a history of diarrhea and the incidence of stunting in toddlers aged 0-59 months in East Lombok Regency in 2018. When the risk value test was carried out, the OR value was obtained as 1.56 (95% CI: 0.785 – 3.092) which means that toddlers with a history of diarrhea have a 1.56 times greater risk of experiencing stunting compared to those without a history of diarrhea. As for the variable history of ARI, stunting under five with a history of ARI was 33.3%, while the incidence of stunting among under five who did not have ARI was 40%. The p value obtained from the results of the chi square test was 0.426 or there was no significant relationship between the history of ARI and the incidence of stunting in toddlers. The OR value is 0.64 (95% CI: 0.263 – 1.539) or toddlers who do not have ARI are a protective factor for stunting.

It is known that toddlers with complete immunization (50%) experience more stunting than those with incomplete immunization (40.4%). The OR value obtained from the chi square test was 0.68 (95% CI: 0.295 – 1.554), which means that toddlers who are fully immunized are a protective factor for stunting. With a p value of 0.478 or there is no significant relationship between immunization and the incidence of stunting in toddlers aged 0-59 months in East Lombok Regency in 2018. The percentage of stunting events in toddlers

who consume vitamin A is 45.2% and those who do not consume vitamin A by 44.4%. From the results of the risk analysis carried out, the OR value was 0.97 (0.478 – 1.965), meaning that toddlers who consume vitamin A have a protective factor for suffering from stunting. The p-value obtained from the chi square test, which is 1,000, means that there is no significant relationship between the consumption factor of vitamin A and the incidence of stunting in toddlers aged 0-59 months in East Lombok Regency in 2018.

It was found that most stunted toddlers had a birth weight of <3000 grams or as much as 55.1%. The results of the chi square test show a p value of 0.007, which means that there is a difference in proportions or there is a significant relationship between the birth weight of toddlers and the incidence of stunting in toddlers (0-59 months) in East Lombok Regency in 2018. The OR value shows the number 2.66 (95% CI: 1.358 – 5.248), which means that toddlers with birth weight <3000 grams have a 2.66 times risk of experiencing stunting.

From table 3, most of the stunting in toddlers occurs in toddlers with short mothers, amounting to 60.0% compared to toddlers with tall mothers, amounting to 38.3%. The p value of the chi square test results is 0.026, which means that there is a significant relationship between mother's height and the incidence of stunting in toddlers aged 0-59 months in East Lombok Regency in 2018. When the risk value test was carried out, the OR value was obtained as 2.42 (95% CI: 1.163 – 5.012) which means that toddlers with short mother's height have a 2.42 times greater risk of experiencing stunting.

It was found that 49.5% of toddlers whose mothers had no/never attended school, did not graduate/graduate from SD/MI, 41.1% graduated from junior high and high school, and 14.8% from tertiary institutions. The results of a simple logistic regression test with the last tertiary education as a reference show that there is a specific relationship between low education and cases of stunting in toddlers, where mothers whose last education is <SD have a p-value of 0.003 and mothers whose last education is SMP and SMA have a p-value of 0.015.

In the analysis of the mother's occupation variable, the results showed that the incidence of stunting in toddlers was higher in working mothers, namely 46.2%, compared to toddlers whose mothers did not work, amounting to 37.1%. The results of the chi square analysis that has been carried out, obtained a p value of 0.188, which means that there is no significant relationship between the mother's working status factor and the incidence of stunting in toddlers aged 0-59 months in East Lombok Regency in 2018. The OR value obtained is 1.45 (95% CI: 0.875 – 2.410), which means that toddlers with working mothers have a 1,452 times tendency to experience stunting.

As for the father's smoking habit variable, it was found that most toddlers who experienced stunting (45.6%) had fathers with smoking habits, while the percentage of stunted toddlers with fathers who did not have smoking habits was 35.3%. The results of the chi square test that has been carried out, obtained a p value of 0.575 meaning that there is no difference in proportion or no significant relationship between the father's smoking habit and the incidence of stunting in toddlers aged 0-59 months in East Lombok Regency in 2018. The OR value obtained, which is 1.54 (95% CI: 0.544 – 4.347), means that toddlers with fathers who have smoking habits are 1,538 times more at risk of experiencing stunting.

In table 3 of the analysis above, it is known that most stunted children are found in families with >4 family members (44.2%), compared to <4 family members (40.9%). The chi square analysis test was carried out and the p value was 0.684, which means that there is no difference in proportion or no significant relationship between the number of family members and the incidence of stunting in toddlers aged 0-59 months in East Lombok Regency in 2018. The OR value from the results of the risk analysis is1.15 (95% CI: 0.694 – 1.897) or toddlers with more than 4 family members have a risk of 1.147 to experience stunting.

In addition, it is known that most stunted toddlers are toddlers who do not have MCH books, namely 46.7%, while in the category that has MCH books the percentage of under-fives is stunted by 41.8%. The results of the chi square analysis test obtained a p value of 0.555, which means that there is no difference in proportion or no significant relationship between ownership of the MCH handbook and the incidence of stunting in toddlers aged 0-59 months in East Lombok Regency in 2018. The OR value obtained from the results of the risk analysis, namely 1.22 (95% CI: 0.716 – 2.069) or toddlers who do not have a MCH book have a greater risk of experiencing stunting by 1,217 for experiencing stunting.

As for the ANC variable, stunting was found in the non-standard ANC category of 34%, but in the ANC category which complied with the standard the percentage of stunting was higher, namely 43.5%. The results of the chi square analysis test obtained a p value of 0.308, which means that there is no difference in proportion or no significant relationship between the ANC factor and the incidence of stunting in toddlers aged 0-59 months in East Lombok Regency in 2018. The OR value obtained from the results of the risk analysis, namely 0.67 (95% CI: 0.345 – 1.303) or toddlers with standard ANC have protective factors so they are not susceptible to stunting.

In addition, it was found that 32.4% of stunted toddlers were in toddlers who did not have IMD, while in the category of toddlers who got IMD the stunting rate was 30%. The results of the chi square test showed a p value of 0.943, which means that there was no difference in proportion or no significant relationship between the IMD factor and the incidence of stunting in toddlers (0-59 months) in East Lombok Regency in 2018. The OR value obtained was 1.12 (95% CI: 0.507 – 2.459) indicates that those without IMD have a greater risk of being stunted, which is 1.12 times.

Other variables show results in the form of toddlers who get exclusive breastfeeding have a higher percentage of stunting, amounting to 32.5%, compared to toddlers who do not get exclusive breastfeeding, amounting to 30.6%. The

results of the chi square test show a p value of 1,000, which means there is no difference in proportion or no significant relationship between the factor of exclusive breastfeeding and the incidence of stunting in toddlers (0-59 months) in East Lombok Regency in 2018. The OR value is obtained by 0.92 (95% CI: 0.389 – 2.151) indicating that exclusive breastfeeding has a protective factor for stunting.

In the analysis of the variable defecation habits, the result was the incidence of stunting in toddlers with open defecation habits higher, namely 44.2%, compared to those with good defecation habits, amounting to 41.9%. The results of the chi square analysis that has been carried out, obtained a p value of 0.786, which means that there is no significant relationship between the habit of defecating and the incidence of stunting in toddlers aged 0-59 months in East Lombok Regency in 2018. The OR value obtained is 1.10 (95% CI: 0.686 – 1.760), which means that toddlers who have open defecation habits have a 1.10 times greater risk of experiencing stunting than those with good bowel habits.

Table 3 also shows the results of the analysis of the relationship between sanitation factors and the living environment, namely the area of residence with the incidence of stunting. Most stunting respondents live more in rural areas with a percentage of 43.2%, compared to those living in urban areas, which is 43.0%. The results of the chi square test show a p value of 1,000, meaning that there is no difference in proportion or no significant relationship between the factor of residence and the incidence of stunting in toddlers (0-59 months) in East Lombok Regency in 2018. The OR value indicates the number 1.01 (95% CI: 0.632 – 1.620), which means that toddlers living in rural areas are at risk of 1,011 times suffering from stunting compared to toddlers living in urban areas.

It was found that 45.9% of stunted toddlers were toddlers who needed more than 10 minutes to travel from home to the *puskesmas*. Meanwhile, the percentage of stunted toddlers whose travel time from home to the *puskesmas* is <10 minutes, is 41.6%. The results of the chi square test conducted showed a p value of 0.595 which means there is no difference in proportion or no significant relationship between travel time to the *Puskesmas* and the incidence of stunting in toddlers (0 – 59 months) in East Lombok Regency in 2018. The OR value obtained of 1.19 (95% CI: 0.712 – 1.984), meaning that toddlers who need more than 10 minutes to travel from home to the health center tend to experience stunting.

As for the analysis of the variable source of drinking water, the results were in the form of stunting in toddlers whose drinking water sources were suitable for consumption was higher (44.1%) compared to those whose drinking water sources were not suitable for consumption, amounting to 37.8%. The results of the chi square analysis that has been carried out, obtained a p value of 0.533, which means that there is no significant relationship between the source of drinking water and the incidence of stunting in toddlers aged 0-59 months in East Lombok Regency in 2018. The OR value obtained is 0.77 (95% CI: 0.400 – 1.480), which means that toddlers who consume safe drinking water have a protective factor 0.769 times for stunting.

Variable	*Coef-B*	*p-value*	AOR	95% CI
Birth Weight	1.165	0.002	3.206	1.552 – 6.623
Mother's Employment Status	0.738	0.032	2.091	1.067 – 4.099

Table 4 Results of Multiple Logistic Regression Analysis of Factors Associated with Stunting in Toddlers (0 – 59 months) in East Lombok District

The results of the multivariate analysis that has been carried out show that the dominant factor in the incidence of stunting in toddlers (0-59 months) in East Lombok Regency in 2018 is the birth weight of toddlers with an OR value of 3.21 or toddlers who have a birth weight <3000 grams have a risk of experiencing stunting. 3.21 times larger than the others.

IV. DISCUSSION

- *Birth Weight*

Based on the bivariate analysis performed in table 3, it was found that significant variables were related to stunting, namely birth weight, mother's height, and mother's education. Most stunting toddlers have a birth weight of <3000 grams or as much as 55.1%. The results of the chi square test show a p value of 0.007, which means that there is a difference in proportions or there is a significant relationship between the birth weight of toddlers and the incidence of stunting in toddlers (0 – 59 months) in East Lombok Regency in 2018. The OR value shows the number 2.67 (95% CI: 1.358 – 5.248), which means that toddlers with birth weight <3000 grams have a 2.67 times risk of experiencing stunting. This is in accordance with the results of Muqni, Hadju and Jafar's research (2012) which stated that under-five birth weight is a significant predictor factor in determining stunting nutritional status in infants aged 12-60 months in Makassar [12]. A study conducted in Zimbabwe found that babies born with low-birth-weight experienced growth and development retardation compared to babies born normally [10]. This growth retardation is in line with the non-optimal development of a child's cognitive abilities. Growth retardation referred to here is not only fixated on growing tall, but the growth and development of the organs as well, which increases the risk of developing chronic diseases in the future [13]. Based on multivariate analysis using multiple logistic regression tests, it was found that birth weight was the dominant factor in stunting in this study. It is known that the OR value of the test is 3,206 or it can be interpreted as a toddler who has a birth weight <3000 grams have a risk of experiencing stunting 3.21 times greater than the others. Based on these results, researchers can conclude that toddlers born weighing <3000 grams as well as those born with low birth weight or birth weight <2500 grams have a high risk of experiencing stunting. Therefore, special, and further treatment is needed to improve their nutritional status, by paying attention to their food intake by giving exclusive breastfeeding, complementary foods, as well as

aspects of sanitation and environmental hygiene to prevent the occurrence of infectious diseases.

In addition, low birth weight babies can also be influenced by maternal factors, one of which is the age of the mother, because the age of the mother affects a person's ability to capture information and apply it properly, so that their nutritional needs and those of their families are well met, so that the expectant mother and her fetus are healthy. tend to be born with physiological weight. Reproductive age or a mother who is not old enough to get pregnant affects the nutritional status of the baby, because the mental and reproductive organs are not yet optimal so that the nutritional needs of the baby are also not channeled properly [14]. In Pamungkas, WD and Nurbaety's research (2021) concerning the relationship between young pregnancy and stunting in toddlers, it was stated that pregnancy at a young age or still in its infancy, pregnancy can cause competition for nutritional needs between mother and fetus, which can result in detrimental outcomes for both [15]. Therefore, it is necessary to implement family planning to prevent pregnancy at a young age and prevent unwanted pregnancies.

- *Mother's Height*

Based on the studies that have been conducted, it is known that most of the stunting in toddlers occurs in toddlers with a short mother's height category, amounting to 60% compared to toddlers with a tall mother's height category, amounting to 38.3%. The p value of the chi square test results is 0.026, which means that there is a significant relationship between mother's height and the incidence of stunting in toddlers aged 0-59 months in East Lombok Regency in 2018. When the risk value test was carried out, the OR value was obtained as 2.42 (95% CI: 1.163 – 5.012) which means that toddlers with short mother's height have a 2.42 times greater risk of experiencing stunting. This result is in line with previous studies showing that children born to short mothers or fathers are at high risk of becoming stunted [16]. This result is supported by the theory which states that genetic factors obtained from parents play a role of at least 15% in influencing a child's height [17]. Parents who are short height are most likely to be able to pass on the gene that carries short chromosomes to their children [18]. Another reason is that the mother's height determines cephalo-pelvic disproportion, intrauterine asphyxia, and intrauterine growth retardation. and the baby's birth weight later [19, 20]. This is because individuals with short height tend to have less than optimal organ development, this also causes babies to get low nutrient reserves during pregnancy.

In Kusharisupeni's study (2008) it was found that mothers who had short height coupled with conditions of poor nutritional status from the early trimester to the end of pregnancy, would give birth to babies with low birth weights [21]. This condition can continue with the baby growing stunting. The relationship between mother's height and the incidence of stunting has been previously studied in Egypt involving 1786 children (respondents). This research resulted in a significant relationship between stunting and mother's height [22]. The results of this study are also in line with those conducted in Penanggalan Subdistrict, Subulussalam City, Aceh Province, where from the regression analysis carried out, the results obtained are the dominant risk factor for stunting is short stature from both or one of the parents [23].

- *Mother's Education*

In this study it was also found that there was a significant relationship between the education level of the mother and the incidence of stunting. Parental education plays an important role in the growth process of toddlers, because besides being the main capital in supporting the household economy, it also plays a role in family feeding patterns and childcare patterns [24]. Research conducted by Mustamin, Asbar and Budiawan (2018) also shows that there is a significant relationship between the incidence of stunting and the educational level of parents, meaning that the educational background of parents is an important element that determines the nutritional status of the child [25]. A person's education level affects his ability to receive, process and apply this information in everyday life. If the mother's education and knowledge is low, it will result in the ability to choose and serve food for the family that is in accordance with a balanced nutritional menu and influences behavior in parenting [26]. Fulfillment of food needs and inappropriate parenting can lead to stunting in children. This finding is also supported by the stunting concept framework established by UNICEF, where poor parenting and low education of mothers or caregivers are the causes of stunting [27]. In addition, mothers who have higher education are better able to filter out inaccurate information to avoid untrue news or hoaxes, one of which is related to food restrictions based on culture and tradition, but not in accordance with scientific facts.

V. CONCLUSION

This paper discusses the dominants factor of stunting toddlers aged 0-59 months in East Lombok Regency. It finds that there are 43.2% incidence of stunting toddlers aged 0-59 months in East Lombok Regency. Based on bivariate analysis, there is a relationship between family characteristic, mother's height (p value = 0.026), toddler's birth weight (p value = 0.007), and mother's education (p value = 0.003 for last education <elementary/boarding school and 0.015 for education last junior and high school) with the incidence of stunting in toddlers aged 0-59 months in East Lombok Regency in 2018. Despite that, there is no relationship between the incidence of stunting with gender, birth weight, Diarrhea, ARI, Defecation Habits, Immunization, Consumption of Vitamin A, Mother's Education, Father's Smoking Habit, Number of Family Members, Number of Toddlers in the Family, Initiation of Breastfeeding Early age, history of exclusive breastfeeding, ownership of the MCH handbook, and ANC, area of residence, time to reach health center, and source of drinking water with the incidence of stunting in toddlers aged 0-59 months in East Lombok District. This study found that the most dominant risk factor associated with the incidence of stunting in toddlers aged 0-59 months in East Lombok Regency, is birth weight with an OR value of 3.21.

Furthermore, as the dominant factor of stunting is the baby's birth weight which is closely related to the nutritional status of the mother, a stunting prevention program is needed from an early age. In addition to monitoring the nutritional status of pregnant women, breastfeeding mothers, and toddlers, it is hoped that there will be monitoring of nutritional

status for women of childbearing age also at the *Posyandu*. In addition, babies with low birth weight are often found in young mothers because in the East Lombok area there are still many early marriages. Thus, if you look at the nutritional status of the mother, the mental readiness and the reproductive organs of the mother are not optimal for pregnancy and are prone to giving birth to low-birth-weight babies. The steps that can be taken by the East Lombok Health government are to promote health promotion related to stunting and prevent early marriage among underage by holding socialization or competitions with the theme of stunting. Another suggestion that can be given is that it is hoped that the East Lombok health service government can carry out health promotion to the community by socializing a minimum birth weight of 3000 grams to avoid stunting.

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