



## ANALYSIS RISK FACTORS AND PREVENTION MANAGEMENT STUNTING

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### ABSTRACT

**Background:** Stunting is a condition where there is failure to grow in children under five years old (babies under five years) caused by chronic malnutrition so that the child is too short for his age. Short (stunted) toddlers are influenced by many factors such as Low birth weight (LBW), exclusive breastfeeding, infectious diseases, and completeness of basic immunization.

**Objective:** The aim of this study was to analyze the risk factors for stunting in toddlers aged 24 months-60 months at the Mandai Community Health Center, Maros Regency in 2023.

**Method:** The type of research used was observational with an analytical research type in the case control study approach, namely remotely analyzing subjects in the form of 68 cases identified as stunting and comparing them with a control group of 68 who did not experience stunting. Data were processed and analyzed using the Odds Ratio (OR) test in the SPSS program.

**Result:** The results of this study show that there is an OR value for birth weight of 22.50, an OR value for exclusive breastfeeding of 17.05, an OR value for infectious diseases of 12.90, and completeness of basic immunization of 18.85.

**Conclusion:** From the above data it is concluded that Weight Birth of babies, exclusive breastfeeding, infectious diseases and completeness of basic immunization are risk factors for the incidence of stunting in toddlers in the working area of the Mandai Community Health Center, Maros Regency .

## INTRODUCTION

Stunting is a condition where children under the age of five (babies under the age of five) engage in stunting, experiencing failure to grow and develop, resulting in the child being too small for his age. Malnutrition can occur during pregnancy and the first few weeks after birth. Stunting will not be visible until a child is two years old. Toddlers are classified as stunted if their body weight (BW) or height relative to their age does not comply with the WHO-MGRS (Multicentre Growth Reference Study) guidelines. However, the Ministry of Health claims that toddlers are said to be severely stunted if their z-score is less than -3SD (Nisa, 2019).

Stunting due to chronic malnutrition is a problem of the past, present and future. Stunting not only impacts the ability to develop, but also mental, and even intellectual health. According to the World Health Organization, there were 149,2 million cases of stunting globally in 2020, or 22% of the population. In Indonesia, stunting ((shortness of breath) attacks 30% of children under the age of five or around 7 million children under five according to Basic Health Research statistic (Riskesdas 2018) (Teja, 2022).

Based on findings according to the survey Indonesian Nutrition Status, Ministry Health, frequency of stunting in toddlers it is classified as tall 27,2% ranked 10th the prevalence of children under five is highest, while in Makassar reaches 18,2% (SSGI, 2022).

Stunting in toddlers is caused by various things, including BW (Birth Weight) which is also called Low Birth Weight (LBW) in babies, exclusive breastfeeding, and viral infection. Newborns with low birth weight experience intrauterine growth retardation in the womb, which lasts until later in life, causing them to grow and develop more slowly. They will grow and develop at a slower rate than newborns after birth. Due to improper functioning of the digestive tract, such as the inability to absorb fat and digest protein effectively, babies with poor birth weight also face digestive problems, resulting in insufficient nutritional reserves in the body.

As the result, the growth of babies with low birth weight. Stunting will occur if this condition continues with insufficient food supplies, frequent infections, and poor health service (Windasari et al., 2020). There are a number of risk factors for childhood stunting. Stunting was most commonly associated with low birth weight, according to multiple Indonesian research (Aryastami et al., 2017).

Maternal parity, anemia, inadequate nutrition throughout pregnancy, pregnancy difficulties, and chronic energy deficiency (KEK) are some of the factors that contribute to low birth weight (LBW). Babies with low body weight (LBW) require intensive care since they are susceptible to hypothermia and premature organ development, which can eventually result in mortality (Proverawati, A. and Misaroh, 2010). Infants that are born underweight will grow slowly, imperfectly,

and will eventually cause stunting in their offspring. It is possible to prevent stunting in pregnant women by maintaining a better nutritional status during their pregnancy (Syakur, 2021).

Based on research by Dessyka Febria, et al., statistical tests using chi-square analysis showed a p-value of less than 0.05 (0.0370.05) which indicates a relationship between low birth weight and the prevalence of stunting (Febria, et al., 2022).

Breast milk produced by phonemic breast milk is produced exclusively in the early minutes of breastfeeding, while breast milk is produced exclusively towards the end of breastfeeding. Breast milk is the best food source of calcium because it has a balanced nutritional profile and is suitable for the growth and development demands of babies up to 6 months of age. According to research by Cyntaka et al, there is a relationship between the prevalence of stunting in toddlers and exclusive breastfeeding.

According to research findings, stunting occurred in 44 children (47,8%), 38 toddlers did not receive exclusive breastfeeding, and 6 toddlers received exclusive breastfeeding. Based on bivariate research, there is a relationship between the prevalence of stunting and exclusive breastfeeding ( $p=0.001$ ). Based on the finding of this research, there is a relationship between exclusive breastfeeding and the prevalence of stunting in the Selopampang work area. Temanggung District Hospital (Chyntaka & Putri, 2020).

Stunting has several direct causes, including infectious diseases. It is impossible to separate the relationship between infectious disease or comorbidities in toddlers and adequate food intake. If the food intake is insufficient, more infection diseases will occur and this will make the situation worse. Maineny et al. found a significant relationship between a history of viral infection and the prevalence of stunting in children aged 24-36 months, with p-value of 0.001 and OR value of 4.200 (1.760-10.020) (p-value 0.5). Children who have a history of frequent infections are 4.2 times more likely to contract infectious diseases than children aged 24-36 months who have a history of rarely experiencing infections and experience stunting (Maineny et al., 2022).

The immunization process is a faster and more efficient technique for protecting children from dangerous infection. Apart from protecting the baby, this also reduces the possibility of spreading disease. The immunization process in children involve giving vaccination, which stimulate their immune system to fight disease-causing viruses. According to research by Wanda et al., there is an increased risk of stunting 4.9 times more often in toddlers with inadequate immunization compared to toddlers with sufficient complete immunization, and there is a relationship between the history of basic immunization status and the prevalence of stunting in toddlers. Toddlers in Hegarmanah village, Subdistrict Jatinangor (Wanda et al., 2021).

## METHODS

The type of research used in this research is observational with a “Case Control Study” (case control) approach, namely the status of the research design carried out by identifying subjects in the form of cases, of which 68 were not stunted. The aim of this research is to determine the risk factors for stunting in toddlers in the Mandai Community Health Center work area, Maros Regency. The population in this study were all toddlers in the Mandai health centre working area in Maros district. The sample in this study was 136 consisting of 68 cases and 68 control.

The data in this research, namely primary data and secondary data. The type of primary data collected is the characteristics of toddlers and mothers, namely gender, age of

toddler, age of mother, education and employment as well as data regarding exclusive breastfeeding variables. Data was obtained by conducting interviews with respondents. Data analysis using univariate analysis to see the characteristics of respondents and bivariate to analyze the risk and incidence of stunting using the odd ratio (OR) test and lower and upper limit value to see its significance.

## RESULTS

Research results from 4 independent variables with a total sample of 136 babies. Obtained all risk variables for stunting. The results of this research were analyzed and explained in the table below.

**Table 1**  
**Analysis of Risk Factors for Birth Weight and Stunting Incidents at Mandai Community Health Center, Maros Regency**

Birth Weight	Control Stunting				Amount	OR ( CI 95% )
	Case		Control			
	n	%	n	%		
LBW	51	75	8	11,8	59	22,50 (8,97-56,43)
Normal	17	25	60	88,2	77	
<i>Total</i>	68	100	68	100	136	

*Source: Primary Data, 2023*

Table 1 shows that of the 59 with low birth weight there were 51 cases of stunting (75,0%), while the controls were 8 (11,8%) and of the 77 with normal birth weight there were 17 cases of stunting (25,0%) and controls as many as 60 (88,2%). The result of

the odd ratio analysis with a value 95% c in toddler, confidence interval obtained a value of OR=22,50, this means that LBW with positive risk factors are 22,50 times more likely to experience stunting compared to toddlers who have negative risk factors

or are born with normal weight, because  $OR > 1$  means LBW is a risk factor for stunting. The result of the lower limit value of 8.97 and upper limit of 56,43 do not include a value of

1, this means that there is a significant relationship between LBW and stunting in the Mandai Community Health Center Working Area, Maros Regency.

**Table 2**  
**Analysis of Risk Factors for Exclusive Breastfeeding and Incidents at Mandai Community Health Center, Maros Regency**

Providing Exclusive Breastfeeding	Status Stunting				Amount	OR ( CI 95% )
	case		control			
	n	%	n	%		
Not Exclusive Breastfeeding	45	66,2	7	10,3	52	17,05 (6,73-43,19)
Exclusive Breastfeeding	23	33,8	61	89,7	84	
<b>Total</b>	68	100	68	100	136	

*Source: Primary Data, 2023*

Table 2 shows that of the 52 toddler who were not given exclusive breast milk, there were 45 (66,2%) cases of stunting, while the controls or those who did not suffer from stunting were 7 (10,3%) and of the 84 toddlers who were given exclusive breast milk there were as many cases of stunting, 23 (33,8%) and controls or not suffering from stunting were 60 (88,2%). The result of the odds ratio analysis with a 95% confidence interval obtained a value  $OR=17,05\%$ , this mean that giving exclusive breast milk with positive risk factors has a

17.05 times risk of experiencing stunting compared to toddler who have negative risk factors are given exclusive breastfeeding, because  $OR > 1$  means exclusive breastfeeding is a risk factor for stunting. The result of the lower limit value of 6.73 and the upper limit of 43,19 do not include a value of 1, this means that there is significant relationship exclusibe breastfeeding and the incidence of stunting in toddlers in the Mandai Community Health Centre working area, Maros Regency.

**Table 3**  
**Analysis of Risk Factors for Infectious Diseases with Stunting in Community Health Center Mandai, Maros Regency**

Infectious Disease	Status Stunting				Amount	OR ( CI 95% )
	Case		Control			
	n	%	n	%		
There is an infectious diseases	60	88,2	25	36,8	85	12,90 (5,31-31,32)
No infection disease	8	11,8	43	63,2	51	
<b>Total</b>	68	100	68	100	136	

*Source: Primary data, 2023*

Table 3 shows that of the 85 toddlers who had infection diseases, there were 60 (66,2%) cases of stunting, while the controls or those who did not suffer from stunting were 25 (36,8%) and of the 51 toddlers who did not suffer from infectious disease there were as many cases of stunting 8 (11,8%) and controls not suffering from stunting were 43 (63,2%). The result of the odds ratio analysis with a 95% confidence interval obtained a value of OR=12,90, this means that infectious disease with positive risk

factors have a 12,90 times risk of experiencing stunting compared to toddlers who have negative risk factors or no infectious disease, because OR>1 means infectious disease are a risk factor for stunting. The result of the lower limit value of 5,31 and upper limit of 31,32 do not include a value of 1, this means that there is a significant relationship between infectious diseases and the incidence of stunting in toddlers in the Mandai Community Health Center Working Area, Maros Regency.

**Table 4**  
**Risk Factors for Complete Basic Immunization with Stunting Incidents at Mandai Community Health Center, Maros Regency**

Basic immunization Equipment	Status Stunting				Amount	OR ( CI 95% )
	Case		Control			
	n	%	n	%		
Incomplete	52	76,5	10	14,7	62	18,85
Complete	16	23,5	58	85,3	74	(7,86-
<i>Total</i>	68	100	68	100	136	45,18)

*Source: Primary data, 2023*

Table 4. shows that of the 62 toddlers who did not have complete basic immunization, there were 52 (76,5%) cases of stunting, while the controls or those who did not suffer from stunting were 10 (14,7%), of the 74 toddlers who had complete basic immunization, there were as many cases of stunting. 16 (23,5%) and controls or not suffering from stunting were 58 (85,3%). The result of the Odd Ratio analysis with a 95% confidence

interval obtained a value of OR=18,85, this means that complete basic immunization with positive risk factor is 19 times more likely to experience stunting compared to toddlers who have negative risk factors or have complete basic immunization with positive risk factors or have complete basic immunization, because OR> 1 means completeness of basic immunization is a risk factor for stunting. The result of the lower limit

value of 5,31 and the upper limit of 31,32 do not include a value of 1, this means that there is a significant relationship between basic

immunization completeness and the incidence of stunting among toddlers in the Mandai Community Health Center work area, Maros Regency.

## **DISCUSSION**

### **1. Analysis of Risk Factors for Birth Weight and Stunting**

Birth weight is based on the mother's nutritional status before and during pregnancy, according to Sinaga et al. 2021 Birth weight is the closest measure of maternal nutrition and can predict a child's growth and development in the future. At a young age, chronic hunger causes stunting. Stunted children, like normal children, began to lose their ability to grow and develop at the age of three to four months.

The reason behind children experiencing stunting is that they either suffered growth retardation or stunted growth throughout their time in the womb (Yulianti Triwahyuningsih & Nur Prayugi, 2018). Chronic energy shortage, anemia, inadequate nutrition, pregnancy difficulties, maternal parity, and birth spacing are some of the factors that contribute to low birth weight (LBW) (Syakur et al., 2022).

The finding of this study shows that babies with Low Birth Weight (LBW) experience stunting because mothers rarely have pregnancy checks during pregnancy, making it difficult to know the health of the baby they are carrying. Therefore, no efforts were made to overcome this situation, and the

baby's needs while still in the womb were met, as evidenced by the ANC incomplete rate of 73,5%. Findings according to this research, birth weight increases, birth weight increases the likelihood of stunting, with a 22 times greater risk of stunting related to birth weight compared to normal birth weight. Because the number 1 is excluded from finding of a lower limit of 8,97 and upper limit of 56,43, the prevalence of stunting is strongly correlated with birth weight.

The findings of this study are consistent with research from Semarang that discovered a link between the occurrence in toddlers and the history of LBW (Widya, 2022). The findings of this study are also in line with the findings of sylvia (2023) who concluded that there is a relationship between birth weight and the prevalence of stunting. Other research shows findings that are comparable to research by Agustina W, & Faturrahman (2022). Based on research findings, the prevalence of stunting and history of birth weight are significantly correlated. Stuntedness is 3.8 times more common in children with a history of Low Birth Weight (LBW) compared to children without history of LBW. However, this research does not support research by Maya Trisiswati (2019)

wich states that there is no relationship between birth weight and the prevalence of stunting. (Trisiswati et al. 2019).

## **2. Risk Factor Analysis of Exclusive Breastfeeding with Stunting.**

The advantages of exclusive breastfeeding for babies according to Lois et al. (2022), including complete nutrition, increased body strength, increased stability of mental and emotional intelligence, as well as spiritual maturity followed by positive social growth. In addition, because breast milk contains antibodies, it is easy digested and absorbed, and contain fat, calories, carbohydrates, proteins and vitamins and provides protection against allergies and infectious disease. It also stimulate intelligence.

Compared with babies who received exclusive breast milk, research findings showed that children experienced stunting when mothers did not give newborn babies exclusive breast milk until they were six months old. This research shows that there is a strong correlation between stunting and exclusive breastfeeding, which indicates that this is a risk factor for stunting. Compared with children who are exclusively breastfed, babies who do not receive breast milk have a 17 fold increased risk of stunting. It is not included in the results of the lower limit of 6,73 and upper limit of 43,19, this means that the incidence of stunting is significantly related to exclusive breastfeeding. In this study, 33,8% of exclusively breastfed babies experienced

stunting because when the baby received additional food, the mother did not pay attention to the nutrition consumed by her baby.

The findings of this research are in line with research by Febiyanti & Wiwin (2021) which found a relationship between the prevalence of stunting in toddlers and exclusive breastfeeding. Sambo et al. (2022) conducted further research consistent with our research. Additionally, studies carried out in Kab. Selayar demonstrate a strong correlation between the prevalence of stunting and exclusive breastfeeding (Musaidah & Syakur, n.d.). This research findings obtained at  $P=0,000 (< \alpha =0,05)$  showed a correlation between the frequency of stunting in children aged 3-5 years and exclusive breastfeeding. The findings of this study are consistent with research from Jeneponto South Sulawesi that Exclusive Breastfeeding are risk factors for stunting (Syakur et al., 2023) On the other hand, this research contradicts the research of Novayanti et al. (2021) who found relationship between prevalence stunting with exclusive breastfeeding

## **3. Analysis of Risk Factors for Infectious Diseases with Stunting Events**

Sumartini (2022) believes that there is a reciprocal relationship between nutritional status and infectious diseases. Specially, although poor nutrition can increase the risk of contracting diseases, infectious diseases can also reduce food intake, impair nutrient loss, and increase the need for infectious metabolite.



Base on research findings, children aged between 24 and 60 months who suffer from acute respiratory infections and worm infections experience stunting. This research shows that worm infection and acute respiratory infections, are risk factors for stunting. There is a no correlation between worm infections and acute respiratory infections, and children with worm infections have 12 fold increased risk of stunting. Because the risk is no number 1 in the finding of the lower limit of 5,31 and upper limit of 31,32, it can be concluded that there is a strong relationship between the occurrence of infectious diseases and stunting. Base on this research, 11,8% of individuals with minimal risk factors for infectious diseases experienced stunting due to not living a healthy lifestyle.

The findings of this study are consistent with finding of Solin et al. (2019) who found a correlation between the prevalence of stunting in toddlers and infectious disease in their research conclusion. Tuhidah's (2020) research finding support the conclusion that babies who receive complete immunization mostly have tall bodies compared to their age, while the majority of toddlers who receive insufficient immunization have relatively small bodies. Statistical study of the Spearman Rank test produces a p value of 0,000 which indicates a significant correlation between the incidence of stunting and basic vaccination history. This research contradicts the research findings of Suhartini (2020) which found no relationship between the prevalence of

stunting in toddlers and a history of infectious diseases.

#### **4. Analysis of risk factor for completing basic immunization against stunting**

One proactive strategy to offer someone a fighting chance against meningitis is to vaccinate them. Immunization is a way to strengthen a person's defense does not develop if exposed to the same antigen again. Immunization is a method used to protect adults, adolescents, and children from meningitis. Immunization is the result of antigen and antibody reactions, in immunology, antigens are referred to as poisons or germs (Solin et al., 2019).

Research findings show that incomplete immunization significantly increases the likelihood of stunting eighteen times more often than complete immunization, and that completeness of basic immunization is a risk factor of stunting. Because there is no value of 1 in the finding of the lower limit of 7,86 and upper limit of 45,18, it can be concluded that there is a strong relationship between the incidence of stunting and completion of basic vaccination. 23,5% of toddlers in this study had low risk factors for stunting. This is caused by parent's ignorance of the importance of immunizing their toddlers and these concern about potential side effects of vaccination, such as fever after vaccination.

The findings of this study are consistent with the finding of Darmawan et al. (2022) who also reported a correlation between the occurrence of stunting and fulfilment of basic

immunization. According to research by Tauhidan (2020), the incidence of stunting and growth and development disorder in toddlers is greatly influenced by a child's basic vaccination level. This is shown by the result of the Multivariate Path Analysis Test which shows that the indirect effect (-0,117). However, this research contradicts the research of Noordiati et al. (2022) who found no evidence of a significant correlation between the frequency of stunting and completion of basic vaccination. Research conducted in West Sumatra also showed that there was no relationship between immunization status and the incidence of stunting (Aprilia et al., 2023; Atifa Rifana, 2022).

## CONCLUSION

From the research result, it can be concluded that birth weight, exclusive

breastfeeding, infectious disease and completeness of basic immunization are risk factor for stunting in toddlers in the work area of the Mandai Public Health Center, Maros Regency.

## SUGGESTION

It is recommended that mothers during pregnancy consume a balanced diet so that the mother and fetus are well-nourished during pregnancy so that the baby is born with a normal weight. Pregnant women carry out ANC (Antenatal Care) at nearest Community Health Center or posyandu. Complete, the mother give exclusive breast milk to her baby, as well as, the mother pay attention to the toddler's personal hygiene to avoid infectious disease and actively carries out basic complete immunization before the age of 1 year.

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