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Factors Causing Stunting in Toddlers in The Kluwut Health Center Work Area

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ABSTRACT

Stunting is one of the nutritional problems of children in Indonesia, with a high prevalence rate. Several factors cause stunting nutrition problems, including a history of low birth weight, basic immunization status, history of exclusive breastfeeding, history of complementary feeding, and the mother's employment status. The purpose of this research is to determine the relationship between the incidence of stunting and a history of low birth weight, basic immunization status, history of exclusive breastfeeding, history of giving complementary feeding, and maternal employment status. The method employed in this research is quantitative, utilizing a case-control research design. The sample in this research amounted to 98 toddlers aged 24-59 months. The instruments in this research are microtoise, questionnaire sheets, and KIA books. The statistical test used to process the data is the Chi-Square Test. The result of this research is, there is a relationship between the incidence of stunting with a history of low birth weight (p = 0.001, OR = 5.97), there is a relationship between the incidence of stunting and basic immunization status (p = 0.002, OR = 3.54), there is a relationship between the incidence of stunting and history of exclusive breastfeeding (p=0.001, OR=10.57), there was a relationship between the incidence of stunting and the history of complementary feeding (p=0.001, OR=8.53), there was a relationship between the incidence of stunting and the mother's employment status (p =0.001, OR=9.64), so it can be concluded that there is a relationship between the incidence of stunting with a history of low birth weight, immunization status, history of exclusive breastfeeding, history of giving complementary feeding and maternal employment status.

Keywords: stunting, history of low birth weight, basic immunization status, history of exclusive breastfeeding, history of complementary feeding, and mother's employment status

INTRODUCTION

Stunting is a form of nutritional disorder in children in Indonesia that arises due to chronic malnutrition in toddlers (children under 5 years of age), causing the child to have a height that is too short for his age (TNP2K, 2017). Chronic malnutrition in toddlers can occur from the time the baby is still in the mother's womb or a few days after birth because of not getting good nutritional intake; as a result, stunting nutrition problems can occur. Still, it can only be seen when the child is 2 (two) years old (Ramayulis et al, 2018). Stunting conditions in children can be determined by anthropometric measurements using the Height-for-Age index (H/A). Children are said to have stunted nutritional problems if the results of TB/U measurements are at a z-score value of -2 SD or less (standard deviation) (Ministry of Health of the Republic of Indonesia, 2020).

According to the World Health Organization's (WHO) 2018 data on stunting, Indonesia has the second-highest prevalence of stunting in Southeast Asia and the fifth-highest globally, at 30.8%. The prevalence of stunting is reported to be high and constitutes a significant health issue that must be addressed promptly, particularly if it reaches 20% or more (WHO, 2020). In 2021, the Indonesian Toddler Nutrition Status Survey (SSGI) reported that stunting in Indonesia persisted at a prevalence rate of 24.4%, affecting approximately 5.33 million children under the age of five who experienced stunted growth. In line with these conditions, the 2018 Central Java Riskesdas results show that the prevalence of stunting among toddlers in Brebes Regency reached 20.17% (Riskesdas, 2019). Data from the Brebes Regency Health Office in 2021 indicated that the highest prevalence of stunting in Brebes Regency was in the working area of the Kluwut Health Center, at 26.49% of the 2,775 toddlers weighed (Brebes Regency Health Office, 2022). In addition, based on the results of a preliminary study conducted in March 2022 at the Kluwut Health Center, it was found that 436 cases of stunting, or 27.11% of the 1,608 toddlers aged 24-59 months, were identified.

Several direct and indirect factors can contribute to children experiencing nutritional problems. One of the factors that directly causes children to experience stunting problems is a history of low birth weight (LBW) (Wijayanti, 2019). Rahayu, A et al. (2015) in their research found that there was a 5.87 times higher risk in children born with low-birth-weight conditions to experience stunting compared to children born with normal weight. Immunization aims to increase immunity in children, especially toddlers. Complete basic vaccination is given to children aged less than 1 month to 9 months old, 6 times. Al-rahmad et al. (2013) in their research found that children who were not given complete basic immunization had a four times greater chance of experiencing nutritional stunting problems compared to children who received complete basic vaccination.

A history of exclusive breastfeeding is also one of the direct factors that can cause children to become stunted. Inadequate nutritional intake, including exclusive breastfeeding that is less than 6 (six) months, can often affect children by infectious diseases. Breast milk (Breast Milk) has a rich content of nutrients; this content can reduce the risk of contagious diseases, which, if they occur in the long term, can interfere with the absorption of nutrients in the child's body and increase malnutrition, so that they are at risk of stunting (Savita & Amelia, 2020). Based on research by Nugraheni et al (2020), children aged 6 to 24 months who do not receive exclusive breastfeeding can have a risk of stunting by 1.28 times when compared to children who receive exclusive breastfeeding from their mothers.

WHO recommends that children aged 6 to 23 months get adequate MP-Breast Milk, namely by being given at least four of the seven types of foods in the form of cereals or other sources of carbohydrates, tubers, eggs and other sources of protein, nuts, fruits and their processing, dairy products, and vegetables or what is commonly called Minimum Dietary Diversity/MMD. In addition to MMD, it is also necessary to pay attention to the provisions of Drinking Meal Frequency (DMF), which refers to the frequency of giving complementary feeding that is appropriate for the baby's age

(Atmarita, 2018). According to research conducted by Wandini et al. (2021), toddlers with inadequate complementary feeding are 0.083 times more likely to experience nutritional stunting problems when compared to toddlers who receive adequate complementary feeding.

According to research conducted by Mesfin et al (2015), mothers who have jobs outside the home are 1.71 times more likely to have children who experience stunting. Work is a business or activity that is carried out to earn income. The mother's job status greatly determines the behavior of the mother in raising children, including the fulfillment of nutritional needs. Mothers who have jobs outside the home may spend less time with their children, which can lead to improper control of food intake and affect children's growth and development, potentially causing stunting problems (Aisyah et al., 2019).

If the risk factors that cause stunting are not adequately addressed, the nutritional problem of stunting is likely to continue increasing annually. Therefore, in this study, the researcher is interested in researching "Factors Related to the Incidence of Stunting in Toddlers Aged 24-59 Months in the Working Area of the Kluwut Health Center, Brebes Regency in 2022".

METHOD

This research was conducted in the Kluwut Health Center Working Area, Brebes Regency. The research was conducted from April to September 2022, utilizing a case-control research design. The independent variables in this study consisted of LBW history, basic immunization status, exclusive breastfeeding history, Complementary Feeding history, and maternal employment status. In contrast, the dependent variable was the incidence of stunting. Sample selection was carried out using non-probability sampling techniques and purposive sampling methods, using inclusion criteria, namely toddlers who are 24 to 59 months old and experiencing stunting or not, living in the research area and recording their data at the Kluwut Health Center in 2022, mothers who have worked as factory workers when pregnant until the age of 2 years or a housewife and mother who are willing to become a research respondent by signing an consent sheet, while the exclusive criterion is that mothers who stop being respondents in the middle of the study. The total sample obtained by calculation using the Leševšek formula was 98 toddlers. Univariate data analysis was conducted to describe each variable studied, including stunting, LBW history, immunization status, history of exclusive breastfeeding, complementary feeding, and maternal employment status. Meanwhile, the chi-square statistical test was used to analyze the relationship between LBW history, immunization status, exclusive breastfeeding history, complementary feeding history, and maternal employment status with stunting incidence.

RESULTS AND DISCUSSION

The characteristics of the research respondents, consisting of 98 toddlers and their mothers, are presented in Table 1, including the gender of the toddlers, their age, and the age of their mothers.

Based on the data on respondent characteristics, it is known that the distribution of respondents in this study is dominated by male toddlers, namely 50 out of 98 toddlers (51%). When viewed from the age of toddlers, the majority are aged 24-35 months, with a total of 39 out of 98 toddlers (39.8%), while when viewed from the age of mothers, the majority are mothers aged 23-33 years, as many as 74 out of 98 mothers (75.5%).

Table 1. Respondent Characteristics

Category Responden	Remarks	N	Percentage
Gender (toddler)	Male	50	51 %
	Women	48	49%
Total		**98**	**100%**
Toddler age	24-35 months	39	39,8%
	36-47 months	37	37,8%
	48-59 months	22	22,4%
Total		**98**	**100%**
Mother's Age	23-33 years old	74	75,5%
	34-43 years old	24	24,5%
Total		**98**	100%

The number of samples in the study was in accordance with the calculated required sample size, consisting of 49 toddlers in the case group (who experienced stunting) and 49 toddlers in the control group (who did not experience stunting). The majority of children were born with normal BB as many as 77 out of 98 toddlers (78.6%). The number of toddlers with a complete basic immunization status and those with an incomplete status are the same. The majority of toddlers do not have a history of exclusive breastfeeding, as 75 out of 98 toddlers (76.5%). The majority of toddlers have a history of giving inappropriate complementary feeding, as many as 50 out of 98 toddlers (51%). Finally, the majority of mothers as respondents never worked as factory workers when they were pregnant until their children were 2 years old, or only as IRTs, as many as 58 out of 98 mothers (59.2%).

Table 2. Respondents' views based on the variables studied

Variabel	Category	n	%
Stunting incidence	Not stunted	49	50
	Stunted	49	50
Total		**98**	**100**
History of LBW	No	77	78,6

	Yes	21	21,4
Total		**98**	**100**
Basic immunization status	Complete	49	50
	Incomplete	49	50
Total		**98**	**100**
History of exclusive breastfeeding	Exclusive	23	23,5
	Not exclusive	75	76,5
Total		**98**	**100**
History of complementary feeding administration	Conform	48	49
	Inappropriate	50	51
Total		**98**	**100**
Mother's employment status	Housewives	40	40,8
	Factory workers	58	59,2
Total		**98**	**100**

Regarding bivariate analysis, the results of *the chi square test* showed that there was a relationship between the incidence of stunting and the history of LBW in toddlers aged 24-59 months in the working area of the Kluwut Health Center (p=0.001, OR=5.97), there was a relationship between the incidence of stunting and the basic immunization status in toddlers aged 24-59 months in the working area of the Kluwut Health Center (p=0.002, OR=3.54), there was a relationship between the incidence of stunting with a history of exclusive breastfeeding in toddlers aged 24-59 months in the working area of the Kluwut Health Center (p=0.001, OR=10.57), there was a relationship between the incidence of stunting and the history of complementary feeding in toddlers aged 24-59 months in the working area of the Kluwut Health Center (p=0.001, OR=8.53) and there was a relationship between the incidence of stunting and the employment status of mothers in toddlers aged 24-59 months in the working area of the Kluwut Health Center (p=0.001, OR=9.64). The results of *the chi-square* correlation test are presented in Table 3.

Table 3. Chi-Square correlation test results

History of LBW	***Not Stunting***		***Stunting***		**Total**		***p***	***OR***
	n	**%**	**n**	**%**	**n**	**%**		
No	45	91,8	32	65,3	**77**	**78,6**		
Ya	4	8,2	17	34,7	**21**	**21,4**	**0,001**	**5,97**
Total	**49**	**100**	**49**	**100**	**98**	**100**		

Basic Immunization Status	*Not Stunting*		*Stunting*		Total		*P*	*OR*
	n	%	N	%	N	%		
Complete	32	65,3	17	34,7	**49**	**50**		
Incomplete	17	34,7	32	65,3	**49**	**50**	**0,002**	**3,54**
Total	**49**	**100**	**49**	**100**	**98**	**100**		

History of Exclusive Breastfeeding	*Not Stunting*		*Stunting*		Total		*p*	*OR*
	n	%	n	%	N	%		
Exclusive	20	40,8	3	6,1	**23**	**23,5**		
Not Exclusive	29	59,2	46	93,9	**75**	**76,5**	**0,001**	**10,57**
Total	**49**	**100**	**49**	**100**	**98**	**100**		

History of complementary feeding Giving	*Not Stunting*		*Stunting*		Total		*p*	*OR*
	n	%	N	%	N	%		
Conform	36	73,5	12	24,5	**48**	**49**		
Inappropriate	13	26,5	37	75,5	**50**	**51**	**0,001**	**8,53**
Total	**49**	**100**	**49**	**100**	**98**	**100**		

Mother's Employment Status	*Not Stunting*		*Stunting*		Total		*p*	*OR*
	n	%	n	%	N	%		
Housewives	41	83,7	17	34,7	**58**	**59,2**		
Factory Workers	8	16,3	32	65,3	**40**	**40,8**	**0,001**	**9,64**
Total	**49**	**100**	**49**	**100**	**98**	**100**		

The relationship between stunting incidence and LBW history in toddlers aged 24-59 months in the work area of the Kluwut Health Center

The results showed that of 49 toddlers who were *stunted*, as many as 17 toddlers (34.7%) had a history of low birth weight (< 2,500 grams). These findings indicate that LBW is one of the early life conditions that are often found in toddlers with *stunting* status. Low birth weight generally occurs due to maternal conditions during pregnancy, such as chronic energy deficiency (KEK) and anemia, which cause impaired fetal growth in the womb (Putri et al., 2017). LBW is not a result of *stunting*,but is one of the risk factors that can increase the likelihood of *stunting* in the future. Babies with a history of LBW have experienced intrauterine *growth restriction* (IUGR), so their body size and vital organs are smaller than those of babies with normal birth weight. This condition can persist after birth and has an impact on non-optimal linear growth, particularly in height, thereby increasing the risk of stunting in toddlers (Sari, 2017).

Based on the results of the chi-square statistical test, a p-value of 0.001 was obtained, indicating a significant relationship between the history of LBW and the incidence of *stunting* in toddlers aged 24–59 months in the work area of the Kluwut Health Center in 2022. An *odds ratio* value of 5.97 indicates that toddlers with a history of LBW have almost six times greater chance of experiencing *stunting* than toddlers born with normal weight. These results reinforce the role of LBW as a significant risk factor in the development of *stunting*. The findings of this study are in line with the research conducted by Rahayu, A. et al. (2015) in the working area of the Sungai Karias Health Center, North Hulu Sungai Regency, which showed a significant relationship between birth weight history and the incidence of *stunting* in children under two years of age, with a p value = 0.015 and *an odds ratio* by 5.87. The similarity of these results confirms that the history of LBW is a consistent factor related to the incidence of *stunting* in children.

The relationship between stunting incidence and basic immunization status in toddlers aged 24-59 months in the working area of the Kluwut Health Center

The results showed that as many as 32 out of 49 toddlers (65.3%) who were stunted had an incomplete basic immunization status. This condition suggests that the completeness of basic immunization plays a crucial role in maintaining the health status and growth of children. Research conducted by Bogler et al. (2019) found that immunization, particularly measles immunization, contributes to reducing the risk of *stunting* and weight loss in children in low- and middle-income countries. Toddlers who do not receive complete basic immunizations tend to be more susceptible to various infectious diseases. This vulnerability can lead to a decrease in appetite and an increase in energy needs, resulting in insufficient nutrient intake. If this condition persists repeatedly or for an extended period, it will have a negative impact on the nutritional status of children and increase the risk of *stunting* (Wanda et al., 2021).

The analysis of the relationship between baseline immunization status and stunting incidence was carried out using a chi-square statistical test. The analysis results showed a p-value of 0.002, indicating a significant relationship between basic immunization status and the incidence of *stunting* in toddlers aged 24–59 months in the work area of the Kluwut Health Center in 2022. An *odds ratio* value of 3.54 indicates that toddlers with incomplete basic immunization status have a 3.54 times greater chance of experiencing *stunting* compared to toddlers who receive complete basic immunization. The findings of this study align with the results of research by Al-Rahmad, A. et al. (2013) in the city of Banda Aceh, which examined the incidence of stunting in toddlers based on exclusive breastfeeding, immunization status, and family characteristics. The study revealed a significant relationship between immunization status and stunting incidence, with a p-value of 0.04 and *an odds ratio* of 3.5.

The relationship between stunting incidence and the history of exclusive breastfeeding in toddlers aged 24-59 months in the working area of the Kluwut Health Center

The results showed that most of the stunted toddlers, namely 46 out of 49 toddlers (93.9%), did not have a history of exclusive breastfeeding. These findings confirm the importance of exclusive breastfeeding early in life as a basis for optimal child growth and development. Between the ages of 0 and 6 months, the nutritional needs of babies can be met primarily through breast milk, as it contains complete nutrients and protective factors that play a crucial role in preventing malnutrition and infectious diseases. Feeding food or drinks other than breast milk at an early age risks causing health problems, including diarrhea, because the level of hygiene is not always guaranteed. Additionally, the baby's digestive system is not fully developed at that age. Digestive enzymes in the intestines and the function of the baby's kidneys are not optimal for digesting and excreting metabolic residues from foods other than breast milk, which can have a negative impact on the baby's nutritional status (Ministry of Health, 2012).

The results of statistical analysis using the chi-square test showed a significant relationship between the history of exclusive breastfeeding and the incidence of *stunting* in toddlers aged 24–59 months in the working area of the Kluwut Health Center in 2022 (p = 0.001). An *odds ratio* value of 10.57 showed that toddlers who did not receive exclusive breastfeeding had more than ten times the chance of experiencing *stunting* compared to toddlers who received exclusive breastfeeding. These findings align with research by Nugraheni, D. et al. (2020) in Central Java, which found a significant relationship between exclusive breastfeeding and the incidence of *stunting* in children aged 6–24 months (p = 0.006). These results strengthen the evidence that exclusive breastfeeding is an important protective factor in the prevention of *stunting* in children.

The relationship between stunting incidence and the history of complementary feeding administration in toddlers aged 24-59 months in the working area of the Kluwut Health Center

The findings showed that a history of inappropriate complementary feeding was found in 37 out of 49 stunted toddlers (75.5%). It is known that the total number of toddlers who have a history of giving inappropriate complementary feeding, whether they are stunting or not, is 50 toddlers. Of these, as many as 10 toddlers did not consume at least 4 of the 7 types of foods recommended for adequate MP-Breastfeeding, 15 toddlers consumed complementary feeding with less frequency than recommended according to their age, and 25 toddlers experienced both conditions. complementary feeding is given to children aged 6-23 months to meet their nutritional needs for optimal growth and development; therefore, it must contain complete macronutrients and micronutrients, such as carbohydrates, proteins, fats, minerals, and vitamins. No one type of food can meet all children's nutritional needs; therefore, it is essential to apply a variety of food types in the provision of children's MP-Breastfeeding, in addition to quality, quantity also needs to be considered so that the number of daily nutritional needs is met (Atmarita, 2018). The relationship between stunting incidence and the history of complementary feeding administration was examined using a chi-square statistical test. The analysis results showed a p-value of 0.001, indicating a significant relationship between the incidence of stunting and the history of complementary feeding administration in toddlers aged 24–59 months in the working area of the Kluwut Health Center in 2022. The *odds ratio value* of 8.53 showed that toddlers with a history of inappropriate complementary feeding administration had an 8.53 times greater chance of experiencing stunting compared to toddlers who received complementary feeding as recommended. The results of this study are also in line with the research conducted by Wandini, R et al. (2021), which investigated the provision of complementary breastfeeding to toddlers in the Hanura health center work area, yielding a p-value of 0.000 and an odds ratio of 0.083.

The relationship between stunting incidence and maternal employment status in toddlers aged 24-59 months in the working area of the Kluwut Health Center

Of the total 49 mothers of toddlers with stunted children, as many as 32 mothers (65.3%) were recorded to have worked as factory workers during pregnancy until the child reached the age of 2 years. The mother's job status greatly determines the behavior of the mother in raising children, including the fulfillment of nutritional needs. Mothers who work outside the home may experience reduced time spent with their children, which can lead to poor control over their food intake and subsequent growth and development issues, ultimately resulting in nutritional problems in children (Aisyah et al., 2019). To examine the relationship between the incidence of stunting and the mother's employment status, a chi-square statistical test was conducted using the obtained data. *It produced* a value of p = 0.001 which means that there is a significant relationship between the incidence of *stunting* and the employment status of mothers in toddlers aged 24-59 months in the work area of the Kluwut Health Center in 2022 with *an odd ratio* value of 9.64 which means that toddlers who have a mother who has worked as a factory worker during pregnancy until the age of 2 years have

a 9.64 times greater chance of experiencing *stunting* than toddlers with mothers who are only IRTs. The results of this study are also in line with the research conducted by Mesfin et al. (2015), which investigated the prevalence and factors related to the incidence of stunting among elementary school children in Eastern Ethiopia, with an odds ratio value of 1.71.

CONCLUSION

Based on the results of the research and discussion above, the following can be concluded: Toddlers aged 24-59 months in the work area of the Kluwut Health Center 78.6% do not have a history of LBW, 50% have received complete basic immunizations, 76.5% do not receive exclusive breastfeeding, 51% have a history of inappropriate MP-breastfeeding and 59.2% of mothers under five have or are working as factory workers. A significant relationship was found between the incident of stunting and the history of LBW in toddlers aged 24-59 months in the working area of the Kluwut Health Center (p = 0.001, OR = 5.97). A significant relationship was found between *stunting incidence* and basic immunization status in toddlers aged 24-59 months in the working area of the Kluwut Health Center (p = 0.002, OR = 3.54). A significant relationship was found between the incidence of stunting and the history of exclusive breastfeeding in toddlers aged 24-59 months in the working area of the Kluwut Health Center (p = 0.001, OR = 10.57). A significant relationship was found between the incidence of stunting and the history of complementary feeding administration in toddlers aged 24-59 months in the working area of the Kluwut Health Center (p = 0.001, OR = 8.53). A significant relationship was found between the incidence of stunting and the employment status of mothers aged 24-59 months in the working area of the Kluwut Health Center (p = 0.001, OR = 9.64).

SUGGESTION

The results of this study prove that there is a relationship between the factors studied and the incidence of *stunting* in the region, so it is recommended for mothers who are pregnant or who already have toddlers in the region to be able to pay attention to the factors that cause *stunting* to reduce the prevalence of *stunting* which have not increased again, including the following: Pay attention to food intake and routinely consume blood-boosting tablets during pregnancy to prevent chronic energy deficiency (KEK) and anemia in pregnant women. Routinely visit posyandu to ensure the growth and development of toddlers, including their immunization status, are adequately monitored. Do not give food or drinks other than breast milk until the baby is 6 months old, unless specific medical indications cause the baby not to consume breast milk. Providing adequate complementary feeding to children, namely by meeting at least 4 out of 7 types of food and providing food frequencies that are appropriate for the child's age, so that the child's nutritional needs are met. For mothers who work as factory workers to meet the family's economic needs, it is advisable to continue providing breast milk until the child is 6 months old. For caregivers at home, it is expected to continue providing adequate food so that the child's nutritional status and growth remain optimal.

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