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Analysis of Factors Associated with the Incidence of Stunting in Toddlers in the Working Area of Ketapang II Health Center, East Kotawaringin Regency

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Abstract

National data from the 2021 Indonesian Nutritional Status Survey (SSGI) states that the stunting rate in Indonesia, which is 24.4%, has decreased by 2.8% so that in 2022 it will be 21.6%. The prevalence of stunting in Central Kalimantan Province in 2022 is 26.9%. This states that the prevalence of stunting in Central Kalimantan ranks 11th highest in Indonesia. SSGI results the stunting prevalence of East Kotawaringin Regency in 2020 reached 27.49% and decreased in 2021 to 23.24%. This paper aims to determine the relationship between parenting, education level, income, food intake, IMD history, and exclusive breastfeeding history with the incidence of stunting in toddlers at Ketapang II Health Center. The research method is observational analytic using a cross sectional approach with a population of 447 people obtained 90 people as samples using purposive sampling techniques. The research instrument is a questionnaire. Dependent variable: stunting. Independent variables: parenting, education level, income, food intake, IMD history, and exclusive breastfeeding history. Bivariate analysis using chi square and multivariate using multiple logistic regression. The results showed that there was a relationship between parenting (p = 0.000), education level (p = 0.001), income (p = 0.025), food intake (p = 0.000), BMI history (p = 0.018), and exclusive breastfeeding history (p = 0.000), with the incidence of stunting in toddlers. Parenting variables are most associated with the incidence of stunting in toddlers (Exp(B) = 23,560). This study concluded that there is a relationship between parenting, education level, income, food intake, IMD history, and exclusive breastfeeding history with the incidence of stunting.

Introduction

Stunting can interfere with brain and intelligence development, *stunting* is a major threat to the quality of human resources (HR) in Indonesia. Globally in 2020 the *World Health Organization* stated that as many as 149.2 million or 22% of children under the age of five were *stunted*, and as many as 30.01% were found in Southeast Asia. This number is a serious problem so that efforts must be made to prevent and overcome stunting immediately. National data from the 2021 Indonesian Nutritional Status Survey (SSGI) states that the Ministry of Health, 2020 *stunting* rate in Indonesia, which is 24.4%, has decreased by 2.8% so that in 2022

it will be 21.6%. However, this figure is still below the target set by the government, which is below 14%.

The prevalence of *stunting* in Central Kalimantan Province in 2022 is 26.9%, ranking 11th highest in Indonesia. SSGI results the stunting prevalence of (Ministry of Health, 2022) East Kotawaringin Regency in 2020 reached 27.49%, and decreased in 2021 to 23.24%. Based on the distribution of the prevalence of short and very short toddlers, according to the East Kotawaringin Regency health office, from 17 sub-districts under East Kotawaringin Regency, the highest incidence of *stunting* is in Ketapang sub-district, the working area of the Ketapang II health center, which is 25.33%.

The problem of *stunting* can be caused by many factors including direct and indirect factors, direct factors such as a history of exclusive breastfeeding, low birthweight, infectious diseases such as acute respiratory tract infections (ARI), diarrhea and low consumption of nutritional intake. The most important indirect factors of children in *stunting* such as knowledge, parenting, health services and family characteristics in the form of parental education, parental employment, and parental income (Ariati, 2019).

The short-term impact of *stunting* is associated with an increased risk of morbidity and mortality, adverse effects on child development, as well as lower performance and learning capacity in childhood. The long-term effects of (Soliman et al., 2021) *stunting* include a decline in social and economic status later in life, increasing the risk of infection, metabolic diseases and degenerative diseases, and can reduce productivity in adulthood (Wicaksono & Harsanti, 2020).

Based on this background, researchers are interested in taking a study analyzing factors related to the incidence of *stunting* in toddlers in the work area of the Ketapang II Health Center (review on aspects of parenting, education level, income, food intake, history of initiation of breastfeeding, and history of exclusive breastfeeding).

Methods

This type of research is observational analytic with a *cross-sectional* survey approach with a sample of 90 using *the probability sampling method*. This research will be carried out in the working area of the Ketapang II Health Center in February 2024. The research was conducted for 1 month. This research has obtained Ethical *Clearance*. Data collection is carried out directly to mothers who have toddlers. The independent variables in this study were parenting, education level, income, food intake, history of early breastfeeding initiation and history of exclusive breastfeeding. The dependent variable in this study is the incidence of stunting. The test used was a logistic regression test at a confidence level of 95% (α= 0.05).

The instruments used were questionnaires on the variables of parenting, income, food intake, history of early initiation of breastfeeding and history of exclusive breastfeeding. Validity and reliability tests were conducted on 50 respondents (mothers who have toddlers) in different places from the research location, namely at the Baamang I Health Center.

Result and Discussion

Univariate Analysis Results

Table 1. Percentage of respondents based on variables in the Ketapang II work area

Variable	N	%
Stunting Events		
Stunting	53	58,9
No *Stunting*	37	41,1
Parenting		
Not Good	61	67,8

Good	29	32,2
Education Level		
Low	63	70,0
Tall	27	30,0
Income		
Low	55	61,1
Tall	35	38,9
Food Intake		
Less	58	64,4
Good	32	35,6
IMD History No IMD IMD	 51 39	 56,7 43,3
History of Exclusive Breastfeeding		
Not Exclusive Breastfeeding	47	52,2
Exclusive breastfeeding	43	47,8
Total	90	100,0

Source: Primary data, 2024

Based on table 1, it can be seen that the highest frequency of respondents with stunting incidence is 58.9%. The highest frequency of respondents with poor parenting was 67.8%. The highest frequency of respondents with low education levels was 70.0%. The highest frequency of respondents with low income was 61.1%. The highest frequency of respondents with low food intake was 64.4%. The highest frequency of respondents with no IMD was 56.7%. and the highest frequency of respondents with no exclusive breastfeeding as much as 52.2%.

Results of Bivariate Analysis

Table 2. The results of the analysis of the relationship between parenting, education level, income, food intake, IMD history, exclusive breastfeeding history with the incidence of stunting in the work area of the Ketapang II Health Center

Parenting	**Stunting Events**				**Stunting Events**		**PValue**	**OR**
	Stunting		***Stunting***					
	N	%	N	%	N	%		
Not Good	47	77,0	14	23,0	61	100,0	0,000	12,869
Good	6	20,7	23	79,3	29	100,0		
Total	53	58,9	37	41,1	90	100,0		

Education Level	**Stunting Events**				**Total**		**P Value**	**OR**
	Stunting		***Stunting***					
	N	%	N	%	N	%		
Low	45	71,4	18	28,6	63	100,0	0,001	5,938
Tall	8	29,6	19	70,4	27	100,0		
Total	53	58,9	37	41,1	90	100,0		

Income	**Stunting Events**				**Total**		**P Value**	**OR**
	Stunting		***Stunting***					
	N	%	N	%	N	%		
Low	38	69,1	17	30,9	55	100,0	0,025	2,980

Tall	15	42,9	20	57,1	35	100,0		
Total	53	58,9	37	41,1	90	100,0		

Food Intake	**Stunting Events**				**Total**		**PValue**	**OR**
	Stunting		**Usual**					
	N	%	N	%	N	%		
Less	43	74,1	15	25,9	58	100,0	0,000	6,307
Good	10	31,2	22	68,8	32	100,0		
Total	53	58,9	37	41,1	90	100,0		

History IMD	**Stunting Events**				**Total**		**PValue**	**OR**
	Stunting		**Usual**					
	N	%	N	%	N	%		
No IMD	36	70,6	15	29,4	51	100,0	0,018	3,106
IMD	17	43,6	22	56,4	39	100,0		
Total	53	58,9	37	41,1	90	100,0		

History Exclusive breastfeeding	**Stunting Events**				**Total**		**PValue**	**OR**
	Stunting		**Usual**					
	N	%	N	%	N	%		
Not Exclusive Breastfeeding	37	78,7	10	21,3	47	100,0	0,000	6,244
Exclusive breastfeeding	16	37,2	27	62,8	43	100,0		
Total	53	58,9	37	41,1	90	100,0		

Multivariate Analysis Results

Table 3. The results of the analysis of the relationship between parenting, education level, income, food intake, IMD history, exclusive breastfeeding history with the incidence of stunting in the work area of the Ketapang II Health Center

No	Variable	B	Wald	Sig	Exp (B)	95% CI
1	Parenting	3,160	13,435	0,000	23,560	4,349 – 127,623
2	Education Level	1,803	5,131	0,023	6,068	1,275 – 28,877
3	Food Intake	2,481	9,178	0,002	11,951	2,401 – 59,487
4	IMD History	1,524	4,145	0,042	4,592	1,059 – 19,920
5	History of Exclusive Breastfeeding	1,831	5,779	0,016	6,237	1,402 – 27,744
6	Income	1,402	2,663	0,103	4,062	0,754 – 21,872

Source : primary data, 2024

Based on the table. 2 The results of the bivariate analysis test showed that parenting showed a p value of 0.000 (p<0.5), meaning that H0 was rejected. It can be concluded that there is a relationship between parenting and the incidence of stunting in toddlers in the work area of the Ketapang II Health Center.

The results of the bivariate analysis test showed that the level of education showed a p value of 0.001 (p<0.5), meaning that H0 was rejected. It can be concluded that there is a relationship between the level of education and the incidence of stunting in toddlers in the working area of the Ketapang II Health Center.

The results of the bivariate analysis test showed that income showed a p value of 0.025(p>0.5), meaning that H0 was rejected. It can be concluded that there is a relationship between income and the incidence of stunting in toddlers in the working area of the Ketapang II Health Center.

The results of the bivariate analysis test showed that food intake showed a p value of 0.000 (p>0.5), meaning that H0 was rejected. It can be concluded that there is a relationship between food intake and the incidence of stunting in toddlers in the work area of the Ketapang II Health Center.

The results of the bivariate analysis test showed a history of IMD showing a p value of 0.018 (p>0.5), meaning that H0 was rejected. It can be concluded that there is a relationship between IMD history and the incidence of stunting in toddlers in the work area of the Ketapang II Health Center.

The results of the bivariate analysis test showed that the history of exclusive breastfeeding showed a p value of 0.000 (p>0.5), meaning that H0 was rejected. It can be concluded that there is a relationship between exclusive breastfeeding history and the incidence of stunting in toddlers in the work area of the Ketapang II Health Center.

Multivariate Analysis Results

Based on table 3, the results of the multivariate analysis test Value B are positive on the parenting variable. The magnitude of the relationship is shown by *the Exponent Beta (EXP B) value* of the parenting variable of 23,560, meaning that with the incidence of *stunting* in toddlers in the work area of the Ketapang II Health Center, parenting will be less than 23,560 times more stunting than good parenting.

The B value is positive on the education level variable. The magnitude of the relationship is shown by *the Exponent Beta (EXP B) value* of the variable education level of 6,068, meaning that with the incidence of *stunting* in toddlers in the work area of the Ketapang II Health Center, the low education level will be 6,068 times more stunted than the intake of good food.

The B value is positive on the food intake variable. The magnitude of the relationship is shown by the *Exponent Beta (EXP B) value* of the food intake variable of 11,951, meaning that with the incidence of *stunting* in toddlers in the work area of the Ketapang II Health Center, food intake will be less than 11,951 times more stunting than good food intake.

The value of B is positive in the IMD history variable. The magnitude of the relationship is shown by the *Exponent Beta (EXP B) value* of the IMD history variable of 4,592, meaning that with the incidence of *stunting* in toddlers in the Ketapang II Health Center work area, there will be no history of IMD will be 4,592 times more stunting than the IMD history.

The value of B is positive in the Exclusive breastfeeding history variable. The magnitude of the relationship is shown by the *Exponent Beta (EXP B) value* of the Exclusive Breastfeeding history variable of 6,237, meaning that with the incidence of *stunting* in toddlers in the Ketapang II Health Center work area, there will be 6,237 times more stunting than the history of exclusive breastfeeding.

The value of B is positive on the income variable. This results in no relationship). The variable income of 4,062 means that it has nothing to do with the incidence of *stunting* in toddlers in the work area of the Ketapang II Health Center.

The relationship between parenting and the incidence of stunting in the work area of Puskesmas Ketapang II

Based on the results of statistical analysis, there is a relationship between parenting and the incidence of *stunting* in toddlers in the work area of the Ketapang II Health Center. The results showed that there were as many as 6 respondents with good parenting but their toddlers were

stunted. The results showed an OR value of 12,869. This means that toddlers with mothers who have less parenting have a risk of *stunting* by 12,869 times greater than toddlers who have mothers with good parenting.

This research is also in line with research conducted by Ika and Riona (2021) showing a p-value of 0.000 < of 0.05, so it can be said that there is a relationship between parenting style and the incidence of *stunting* in toddlers aged 24-59 months in Neglasari village, Tanjung Agung Health Center, South Lampung Regency in 2021 (Wati & Sanjaya, 2021).

Low parenting causes poor nutritional status of toddlers. If this happens during the *golden age*, it will cause the brain to not be able to develop optimally and this condition is difficult to recover. The parenting style lacking in this study was on indicators of feeding practices. Mothers who have *stunted* children have a habit of delaying when feeding toddlers. In addition, mothers feed toddlers without paying attention to their nutritional needs. This condition causes toddler food intake to be less good in terms of quality and quantity so that toddlers are prone to *stunting* (Widyaningsih et al., 2018).

The relationship between the level of education and the incidence of stunting in the working area of the Ketapang II Health Center

Based on the results of statistical analysis, there is a relationship between the level of education and the incidence of *stunting* in toddlers in the work area of the Ketapang II Health Center. The results showed that there were as many as 8 respondents with a high level of education but their toddlers were *stunted*. The results showed an OR value of 5.938. This means that toddlers with mothers who have a low level of education have a risk of *stunting* by 5,938 times greater than toddlers who have mothers with a high level of education.

This research is in line with research conducted by Andris et al. (2020) showing a p-value of 0.036 < of 0.05. So it can be said that there is a relationship between the level of education and the incidence of *stunting* in toddlers in Kualu Tambang Kampar village (Wahyuni & Fithriyana, 2020).

The level of education is a very important component. Without knowledge, a person has no basis for making decisions and determining actions in solving problems. Parental knowledge is also one of the causes of the high incidence of *stunting*, because parents who do not have adequate knowledge about *stunting* will affect parents' attitudes (Pratiwi, 2019).

Research conducted by Rahmandiani et al. (2019) said that education with the knowledge of parents of toddlers about *stunting* has a relationship. The level of education can increase parents' understanding in receiving knowledge about *stunting*. Therefore, the level of education greatly affects the knowledge of parents in receiving knowledge about *stunting* (Rahmandiani et al., 2019).

The relationship between income and the incidence of stunting in the working area of the Ketapang II Health Center

Based on the results of statistical analysis, there is a relationship between income and the incidence of *stunting* in toddlers in the work area of the Ketapang II Health Center. The results showed that there were as many as 15 respondents with high incomes but their toddlers were *stunted*. The results showed an OR value of 2,980. This means that toddlers with mothers who have low incomes have a risk of *stunting* events of 2,980 times greater than toddlers who have mothers with high incomes.

This research is in line with research conducted by Fatimah & Lia (2021) showing a p-value of 0.004 < of 0.05. The study stated that there is a relationship between income and the incidence of *stunting* in toddlers in Bangkok village, sub-district (Agustin & Rahmawati, 2021).

Income has a relationship with the incidence of *stunting* because the income received is almost entirely spent on basic needs such as food, but other needs. A high level of income one of them guarantees a person's nutritional status is good, especially in toddlers. This is because the level of income is not necessarily allocated enough for food needs. In addition, family income level has not been related to nutritional status with TB/U indicators (Kurniawati & Yulianto, 2022).

The relationship between food intake and the incidence of stunting in the working area of Puskesmas Ketapang II

Based on the results of statistical analysis, there is a relationship between food intake and the incidence of *stunting* in toddlers in the work area of the Ketapang II Health Center. The results showed that there were as many as 10 respondents with good food intake but their toddlers were *stunted*. The results showed an OR value of 6.307. This means that toddlers with mothers who have less food intake have a risk of *stunting* events of 6,307 times greater than toddlers who have mothers with good food intake.

This research is in line with research conducted by Aprina et al. (2023) showing a p-value of 0.006 < of 0.05. So it can be said that there is a relationship between nutritional intake and the incidence of *stunting* in toddlers in Padang village, Manggeng District, Southwest Aceh Regency (Wati & Musnadi, 2022).

Protein intake, carbohydrates are closely related to *stunting*, sufficient protein is needed for hemoglobin synthesis to run well, toddlers who lack protein consumption have a 10.26 times chance of *stunting*, the adequacy of energy and fat nutrients for the less category in stunted toddlers is higher at 70.8%, the less energy consumption is 4,048 times greater risk of stunting And there is a relationship between fat intake and *stunting* in toddlers, toddlers with low fat intake levels are at risk of *stunting* compared to adequate fat intake levels (Azmy & Mundiastuti, 2018).

The relationship between IMD history and stunting events in the work area of Ketapang II Health Center

Based on the results of statistical analysis, there is a relationship between the history of IMD and the incidence *of stunting* in toddlers in the work area of the Ketapang II Health Center. The results showed that there were as many as 17 respondents with a history of IMD but their toddlers were *stunted*. The results showed an OR value of 3.106. This means that toddlers with mothers who have a history of no IMD have a risk of *stunting* events of 3,106 times greater than toddlers who have mothers with a history of IMD.

This research is in line with research conducted by Lajuna & Ramli (2022) showing a p-value of 0.019 < of 0.05. So it can be said that there is a relationship between IMD History and the incidence of *stunting* in infants aged 0-24 months at the Kramatwatu Health Center in 2021 (Lintang & Azkiya, 2022).

After going through 270 days in the womb, the fetus will come out of the mother's womb through the process of labor. Shortly after the process, the baby must be immediately given nutrition to meet the needs of the baby's body given through IMD. Giving as early as possible, helps babies get colostrum which is good for endurance and nutritional intake, so that children avoid *stunting events* (Anggryni et al., 2021).

The relationship between the history of exclusive breastfeeding and the incidence of stunting in the work area of the Ketapang II Health Center

Based on the results of statistical analysis, there is a relationship between the history of exclusive breastfeeding and the incidence of *stunting* in toddlers in the work area of the Ketapang II Health Center. The results showed that there were as many as 16 respondents with a history of exclusive breastfeeding but their toddlers were *stunted*. The results showed an OR

value of 6.244. This means that toddlers with mothers who have a history of not exclusive breastfeeding have a risk of *stunting* events of 6,244 times greater than toddlers who have mothers with a history of exclusive breastfeeding.

This research is in line with research conducted by Nuraini & Iswati (2022) showing a p-value of 0.023 < of 0.05. So it can be said that there is a relationship between the history of exclusive breastfeeding and the incidence of *stunting* in toddlers 24-59 months in the work area of the Marawola Health Center (Ra'bung et al., 2022).

Breast milk contains special proteins that can increase the immune system of toddlers. Nutritional intake in infants is very important in supporting growth in accordance with the growth chart so that *growth faltering* does not occur which can cause *stunting*. This is in accordance with Julianti & Elni (2020) in Indonesia which shows, children who are not exclusively breastfed have a 40.9% risk of *stunting* (Julianti & Elni, 2020).

dominant actors related to stunting incidents in the working area of Puskesmas Ketapang II

Based on multivariate results from six *independent variables* that meet the requirements of the multivariate model, the parenting variable is the most dominant variable (very strong) associated with the incidence *of stunting* in toddlers with an exponent value of B of 23,560.

Good parenting is that mothers pay attention to the frequency and type of food consumed by their children so that their nutritional needs are met. Good feeding is very important for nutritional intake, not only in terms of what the child eats but the attitude that is a habit of the mother also plays a role. Nutritional status is one of the risk factors for *stunting* (Rahman et al., 2016).

Families that adopt bad parenting habits have a 9 times chance of having poor nutritional status. Parenting patterns are important in the process of child growth and development. One of the factors that affect the growth and development of children is the presence of psychosocial factors which include important things in children's lives, namely the importance of stimulation in parenting. A good parenting pattern is a picture of a child's positive interaction with the main caregiver who plays a role in the emotional and psychological development of the child so as to create normal child growth and development. The role of parents as early as possible will establish a sense of security in their children. This is manifested by physical and psychological contact from the time the child is born to the process of growth and development. Lack of parental affection in the first years has a negative impact on children's growth and development both physically, mentally, and socially. Parental affection will create a close bond (*bonding*) and basic trust (*basic trust*) (Bella et al., 2020).

Conclusion

The results of *bivariate* analysis showed a significant relationship between several factors and the incidence of *stunting* in toddlers in the work area of the Ketapang II Health Center. Of the various variables studied, parenting emerged as the most dominant factor related to the incidence of *stunting*. This highlights the importance of the role of parents or caregivers in influencing a child's growth. Suboptimal parenting, such as lack of attention to diet and nutrition and lack of growth stimulation, can be a major risk factor for *stunting* in toddlers.

In addition to parenting, other variables that also show a significant relationship with the incidence of *stunting* are education level, income, food intake, history of IMD, and history of exclusive breastfeeding. Education level and family income can affect access to resources that support a child's optimal growth, such as access to nutritious food and health services. Meanwhile, the history of IMD and exclusive breastfeeding provides an overview of the health factors that play a role in a child's growth.

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Therefore, interventions to reduce the incidence of *stunting* in the working area of Puskesmas Ketapang II must pay attention not only to economic factors such as education and income, but also aspects of parenting which include diet, nutrition, and stimulation of child growth. Parent empowerment and health counseling programs targeting good parenting can be an effective strategy to reduce the prevalence of *stunting* among children under five in the region.

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