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THE RELATIONSHIP BETWEEN MATERNAL EDUCATION LEVEL AND FAMILY INCOME ON THE INCIDENCE OF STUNTING IN TODDLERS AT THE MADIUN CITY HEALTH CENTER

Nurwasilah [1], Sukma Sahadewa [2*], Andiani [3]
[1] Faculty of Medicine, Wijaya Kusuma University Surabaya
[2,3] Department of IKM, Faculty of Medicine, Wijaya Kusuma University Surabaya
sukma.sahadewa@uwks.ac.id

Abstract

Stunting is a condition that occurs in toddlers who experience growth failure due to chronic malnutrition based on a z-score (TB/U) value of less than -2 SD (Standard Deviation). Stunting can be caused by a low level of maternal knowledge. Family income is also a risk factor for stunting. The purpose of this study was to analyze the relationship between maternal education level and family income on the incidence of stunting in toddlers at the Madiun City Health Center. This study used an analytical observational method with a case control design. The population in this study was all mothers who had toddlers in Madiun City. Respondents in this study consisted of 34 people, obtained from questionnaires with the total sampling method. The results of Chi-Square analysis showed that there was no relationship between maternal education level (p = 0.290), no relationship between family income level (p = 0.628), maternal education level and family income level (p = 0.545) greater than p value = 0.05; showed that there was no relationship between maternal education level and family income level with the incidence of stunting in toddlers at the Madiun City Health Center. There is no relationship between maternal education level and family income with the incidence of stunting in toddlers at the Madiun City Health Center.

Keywords*: Stunting, maternal education, family income*

✉Corresponding author : **Sukma Sahadewa**
Address **:** Surabaya
Email : sukma.sahadewa@uwks.ac.id

INTRODUCTION

Stunting is a condition that occurs in toddlers who experience growth failure due to chronic malnutrition based on a z-score (TB/U) value of less than -2 SD (Standard Deviation). Event stunting It can be caused by decreased cognitive function, decreased concentration, decreased learning power and school achievement, memory impairment, and impaired motor development of children, and has a long-term impact on decreased productivity that can hinder economic growth and cause intergenerational poverty (Darmini et al., 2022).

Number event stunting Currently it is still a nutritional problem in toddlers. The prevalence in the world is around 21.9% or 149 million toddlers experience stunting (Setyo et al., 2022). In Indonesia, the prevalence of children aged less than five years (toddlers) who suffer stunting is the second highest in Southeast Asia with an incidence rate of 31.8% in 2020. Incidence rate stunting The highest in Indonesia is in Timor Leste at 48.8%. In Southeast Asia, Laos is in position after Indonesia with a prevalence of 30.2%. Cambodia then ranks fourth by incidence figures stunting under-five by 29.9%. The Philippines follows with prevalence rates stunting by 28.7%. Meanwhile, Singapore is the prevalence rate of children sufferers stunting the lowest in Southeast Asia with a prevalence rate of only 2.8%.

According to the results of the Indonesian Nutritional Status Study (SSGI) by the Ministry of Health, the incidence rate of toddlers stunting in 2021 it was 24.4%. These are stunting experienced by almost a quarter of Indonesian toddlers last year. In 2021, there were 23.5% of toddlers who experienced stunting in East Java Province. Current prevalence stunting in Madiun City at 12.4%. Even though it is far below the 14% figure that is the national target in 2024, the Madiun City Government continues to reduce the incidence rate stunting with a target of reaching 0%.

Some influencing factors stunting Among them are poverty, lack of awareness about health, poor nutrition and also improper parenting causing growth and development failure in toddlers. Stunting can also be caused by the factor of low maternal knowledge level (Agustin & Rahmawati, 2021). The level of education in a person can be affected when a person receives information. People with better education will be easier to receive information than people with less level of education. This information is used as a provision for mothers to take care of their children in everyday life. The maternal's education level usually affects the maternal's knowledge about toddler nutrition. Where the higher the education, it will be easy to absorb information about health, for example nutritional knowledge. The maternal's level of knowledge plays a significant role with the incidence stunting (Sari & Zelharsandy, 2022).

Level Education of the population in Madiun City with elementary school graduates and below the percentage is 12.87%, junior high school is 14.05%, high school is 19.93%, the highest percentage is SMK graduates at 26.31%, Diploma I/II/III at 5.23%, while residents who graduated from higher education are S1/Diploma IV at 21.60%. Based on these data, it can be seen that the most education completed by residents in Madiun City in 2022 is SMK, which is 26.31%, while the least is Diploma I/II/III, which is 5.23%.

Family income factors are also risk factors of stunting. This is because parents are able to meet all the primary and secondary needs of their children, an adequate family income will support their growth and development (Kartikahadi et al., 2012). Families with incomes less than the Regional Minimum Wage are 6 times more likely to experience stunting. According to the Central Statistics Agency (BPS), the economy of Madiun City grew by 4.73% in 2021. The economic growth of Madiun City in 2021 which reached 4.73 percent, increased 7% from 2020 which was minus 3.39 percent. The purpose of this study was to analyze the relationship between maternal education level and family income on incidence stunting in toddlers at the Madiun City Health Center (Putri et al., 2023).

METHOD

This study used an analytical observational method with *a case control* design. In this study to determine the relationship between maternal education level and family income on the incidence of stunting in toddlers at the Madiun City Health Center. The population in this study was all mothers who had toddlers in Madiun City. Respondents in this study consisted of 34 people, obtained from questionnaires with the total sampling method.

RESULTS & DISCUSSION

Univariate Analysis Results

Respondents in this study consisted of 34 people (100%) who suffered from stunting as much as 50% (17 respondents) and those who did not suffer from stunting as much as 50% (17 respondents). The distribution of respondents based on the degree of Stunting Incidence can be seen in table 1 below

Table 1. Distribution of respondent on stunting incidence

Stunting Events	No. of respondents	%
Stunting	17	50
No stunting	17	50
Total	**34**	**100**

The ages of respondents in this study were mostly aged ≤10 months is 67.6% (23 respondents), while the remaining 32.4% (11 respondents) are aged > 10 months. The distribution of respondents by sex can be seen in table 2 below.

Table 2. Frequency Distribution of Respondents by Age

Age	No. of respondents	%
≤ 10 months	23	67,6
> 10	11	32,4
Total	**34**	**100**

Most of the respondents in this study had a female gender, which was 58.8% (20 respondents), while the remaining 41.2% (14 respondents) had a male gender. The distribution of respondents by gender be seen in table 3 below.

Table 3. Frequency distribution of respondents by gender

Gender	No. of respondents	Percent
Woman	20	58,8
Man	14	41,2
Total	**34**	**100**

In this study, respondents who fell into the working category were 35.3% (12 respondents) and respondents who were included in the non-working category as many as 64.7% (22 respondents). The distribution of respondents based on maternal's occupation can be seen in table 4 below.

Table 4. Frequency Distribution of Respondents by Maternal's Occupation

Category	No. of respondents	Percent
Work	12	35,3
Does not work	22	64,7
Total	**34**	**100**

In this study, respondents who had a low level of education were 38.2% (13 respondents) and respondents who had higher education as many as 61.8% (21 respondents). The distribution of respondents based on maternal education level can be seen in table 5 below.

Table 5. Frequency distribution of respondents based on maternal education level

Category	No. of respondents	Percent
Lower education	13	38,2
Higher education	21	61,8
Total	34	100

In this study, respondents who had income < MSEs in Madiun City were 14.7% (5 respondents) and respondents who had income ≥ UMK Kota Madiun as much as 85.3% (29 respondents). The distribution of respondents based on family income level can be seen in table 6 below

Table 6. Distribution of respondents' frequency by family income level

Category	No. of respondents	Percent
< UMK Kota	5	14,7
≥ UMK City	29	85,3
Total	**34**	**100**

In this study, respondents who had risk factors based on maternal education level and income were 8.8% (3 respondents), respondents who did not have risk factors based on maternal education level and income were 91.2% (31 respondents). The distribution of respondents based on parental employment status can be seen in table 7 below.

Table 7. Distribution of respondents' frequency based on maternal's education level, family income level against stunting groups

Category	No. of respondents	Percent
High risk (<3)	3	8,8
Low risk (≥3)	31	91,2
Total	**34**	**100**

Results of Bivariate Analysis

Table 8: Results of Hypothesis Test Based on Maternal Education Level on Stunting Incidence

Maternal's Education Level	Stunting				P-Val
	Case		Control		
	N	%	N	%	
Lower Education	8	47%	5	29%	0,290
Higher Education	9	53%	12	71%	

From the results of the analysis Chi-Square indicates that the significance value of 0.290 is greater than the value of p value = 0.05; showed that there was no relationship between the maternal's education level and the incidence of stunting in toddlers at the Madiun City Health Center.

Table 9. Results of Hypothesis Test Based on Family Income Level on Stunting Incidence

Family Income Level	Stunting				P-Value
	Case		Control		
	N	%	N	%	
< MSEs	2	12%	3	18%	0,628
≥ UMK	15	88%	14	82%	

From the results of the analysis Chi-Square indicates that the significance value of 0.628 is greater than the value of p value = 0.05; showed that there was no relationship between family income level and the incidence of stunting in toddlers at the Madiun City Health Center.

Table 10. Hypothesis Test Results Based on Maternal Education Level and Family Income Level

Risk Factors (Maternal's Education Level and Family Income Level	Stunting				P-Value
	Case		Control		
	N	%	N	%	
High Risk	2	12%	1	6%	0,545
Low Risk	15	88%	16	94%	

From the results of the analysis Chi-Square indicates that the significance value of 0.545 is greater than the value of p value = 0.05; showed that there was no relationship between maternal education level and family income level with the incidence of stunting in toddlers at the Madiun City Health Center.

DISCUSSION

Figure 4 and 6 showed that respondents who had income < MSEs in Madiun City as much as 14.7% and respondents who had income in MSEs ≥ in Madiun City as much as 85.3%. This shows that the majority of toddler families in the Madiun City Health Center have MSE income in Madiun City. ≥ Both high and low income levels impact a family's ability to afford nutritious food. A family with sufficient money will be able to meet all the primary and secondary needs of its children. Families with good financial condition also have easier access to health services. Children from low-income families typically eat less, both in terms of quantity and variety. People with high socioeconomic levels tend to choose and buy a variety of healthy foods.

Low family income has a direct impact on stunting because it forces families to choose less nutritious foods to meet their nutritional needs. In addition, due to poor food quality, more and more children are malnourished, which causes nutritional problems in toddlers (Yanti & Fauziah, 2021). Stunting is more prevalent in children from low-income families than children from well-off or high-income families (Habimana & Biracyaza, 2019). The results of Wati's research (2018) show that most toddlers with low nutritional status have low-income families. Families with low incomes will usually find it difficult to meet their nutritional needs. Families with middle to lower economic status have the possibility to consume food with low nutrition in toddlers, and this has an impact on the nutritional status of toddlers.

The results found that out of 100% of toddlers, there are 50% of toddlers who are stunted and 50% of toddlers who are not stunted. Some toddlers who are not stunted occur because their parents have provided them with all the essential nutrients for their growth and development, including minerals, vitamins, fats, carbohydrates, and proteins. While stunted toddlers are caused by mothers who do not pay enough attention to the food and health needs of their children, this problem can also be caused by infectious infections that worsen children's health and interfere with their growth. Figure 5 showed that a highly educated mother may have a better outcome for her child's health and nutrition. The maternal's level of education can ease the mother's ability to understand and absorb nutritional information.

Education is needed so that there are more mothers who are able to solve nutrition and nutrition problems in the family and can act as soon as possible if they are not fulfilled (Sutarto et al., 2020).

The function of maternal education is to increase children's insight into themselves and their environment. The length of education taken determines the level of education of the mother. Highly educated mothers are easier to digest health information, especially in educating toddlers every day. Toddler development can be influenced by a number of factors, especially those related to parenting and education. Children who have mothers who are poorly educated may find it difficult to get information, so children tend to experience delays in growth, due to parenting style (Nurmalasari et al., 2020).

The level of education, especially the mother, affects the health of her family, including the nutritional condition of family members. Maternal education also affects parenting for children because mothers are the main food managers at home, so it has a great influence on the nutritional status of all family members (Noviyanti et al., 2020). Stunting is a picture of chronic undernutrition status at the time most important for growth and development in infancy. Stunting is caused by various causes, not only malnutrition that experiences children under five and pregnant women (Ministry of Health of the Republic of Indonesia, Directorate General of Community Nutrition, 2018).

Figure 8 found that there was no relationship between the maternal's education level and the incidence of stunting in toddlers at the Madiun City Health Center, as evidenced by a significance value of 0.290 greater than 0.05. These results show that the level of maternal education is not a factor that causes stunting in toddlers at the Madiun City Health Center. This result is in accordance with research by Suharmianti and Agus (2018) which found no relationship between maternal education level and stunting status. Mothers who have a low level of education may or may not have knowledge about nutrition. Since a high level of education does not mean the mother has sufficient knowledge about healthy nutrition, a high level of maternal education does not guarantee that her child will not suffer from malnutrition. Mothers with low education diligently participate in posyandu and toddler nutrition counseling in order to gain the necessary knowledge and be able to take good care of their children.

Based on research conducted by Satoto in 1997, this could be because the height/age indicator reflects previous nutritional history and is less sensitive to changes in nutritional inputs, where in this case the mother plays a role in the distribution of nutritional inputs. Height can only increase or stay at a certain moment, unlike weight, which can increase, decrease, or remain constant. Under normal circumstances, height grows with age. In addition, there is no relationship between maternal education and the incidence of stunting because the maternal's education level is not the only factor causing the problem of malnutrition because there are many other factors that can influence the occurrence of malnutrition problems.

Based on the data obtained by researchers, there are mothers who have a low level of education but have toddlers who are not stunted, and vice versa mothers who have a high level of education but have toddlers who are stunted due to one factor, namely the sex of the toddler itself. Based on other data obtained, it is known that mothers who have a low level of education but have toddlers who are not stunted are more female than male. Conversely, mothers who have a high level of education but have stunted toddlers are more male than female.

Baby girls have less muscle and more fat than baby boys. Muscle burns more energy than fat so men and women of the same height, weight, and age have different body compositions, which means their energy and nutrient needs will also be different. In general, male toddlers are more active than female toddlers. Male toddlers often engage in more outdoor activities, such as running around, which makes them more likely to come into contact with dirty environments and expend more energy when their intake is restricted.

There is a relationship between nutritional status and sex because gender determines the amount of nutrition a person needs. The difference in body composition between women and men affects the large gap in nutritional needs so that it requires even greater intake needs. Figure 9 showed that there was no relationship between family income level and the incidence of stunting in toddlers at the Madiun City Health Center, as

evidenced by a significance value of 0.628 greater than 0.05. The results of this study are the same as research conducted by Dakhi in 2019 which stated that family income is not a risk factor for stunting. This can be because the income collected is used for various other purposes, not only to buy food. Because high income does not necessarily indicate that the money set aside is sufficient for food needs and is not a guarantee that toddlers will have a good nutritional status.

Based on the data obtained by researchers, there are families with low education levels but have toddlers who are not stunted, and vice versa there are families with high income levels but have toddlers who are stunted due to one of the factors, namely the maternal's occupation. Based on other data obtained, it is known that families with low income levels but have toddlers who are not stunted mostly have mothers who do not work. In contrast, families with high income levels but stunted toddlers mostly have working mothers. A number of articles discussing the characteristics of mothers' employment status state that 75% of working mothers have children who are stunted. The majority of mothers under five in mountainous areas are farmers, so more children are stunted. This is related to non-exclusive breastfeeding because wives who have farmer husbands will help to work in the garden, especially at the beginning of the growing season. As mothers work more in the garden, mothers will leave their children to the care of others while they work. Therefore, before the baby is 6 months old the majority of mothers stop breastfeeding their babies (Leo et al., 2018).

As many as 66% of unemployed mothers have normal children or are not stunted because mothers are always involved in the childcare process and are related to good parenting. Working mothers have a positive impact on income growth, but on the other hand have a negative impact on child development and maintenance. Figure 10 showed that there was no relationship between maternal education level and family income with the incidence of stunting in toddlers at the Madiun City Health Center, as evidenced by a significance value of 0.545 greater than 0.05. As previously explained, the results of this study are in accordance with research conducted by Erfince and Minarni (2020) which found no relationship between maternal education level and stunting incidence and research conducted by Grace, et al (2019) which stated that there was no relationship between income level and stunting incidence.

There is no relationship between the maternal's education level and stunting nutritional status because maternal education is not a guarantee that mothers have more knowledge related to nutrition. From direct observation, mothers who have a low level of education tend not to work, thus giving more time in the morning to go to the posyandu every day to get additional food and nutrition and health counseling (Wartiningsih et al., 2020). There is no relationship between family income level and stunting because families with income below MSEs can manage nutritious and healthy food with easy and affordable products so that during pregnancy mothers can meet nutritional needs and prevent stunting. High family income is not necessarily allocated enough for food needs so it is not a guarantee that the mother will have a good nutritional status. The study did not find any relationship between income and stunting prevention behavior during pregnancy because families with incomes below MSEs can still meet their family's food needs.

Based on the data obtained by researchers, there are toddlers who have high risk factors (mothers who have low levels of education and income) but have toddlers who are not stunted, and vice versa toddlers who have either (high education level with low income levels or vice versa) or all high risk factors (mothers who have high levels of education and income) but have toddlers who are stunted due to several factors i.e. the sex of the toddler and the maternal's occupation. Based on other data obtained, it is known that toddlers who have high risk factors (mothers who have low levels of education and income) but have toddlers who are not stunted are more female than men and mothers who are not working than working mothers. Conversely, toddlers who have either (higher education level with low income level or vice versa) or all high risk factors (mothers who have high education and income levels) but have stunted toddlers are more male than female and working mothers than non-working mothers.

Baby girls have less muscle and more fat than baby boys. Muscle burns more energy than fat so men and women of the same height, weight, and age have different body compositions, which means their energy and nutrient needs will also be

different. In general, male toddlers are more active than female toddlers. Male toddlers often engage in more outdoor activities, such as running around, which makes them more likely to come into contact with dirty environments and expend more energy when their intake is restricted.

There is a relationship between nutritional status and sex because gender determines the amount of nutrition a person needs. The difference in body composition between women and men affects the large gap in nutritional needs so that it requires even greater intake needs. Working mothers are associated with non-exclusive breastfeeding because wives who have farmer husbands will help to work in the garden, especially at the beginning of the growing season. As mothers work more in the garden, mothers will leave their children to the care of others while they work. Therefore, before the baby is 6 months old the majority of mothers stop breastfeeding their babies. As many as 66% of unemployed mothers have normal children or are not stunted because mothers are always involved in the childcare process and are related to good parenting. Working mothers have a positive impact on income growth, but on the other hand have a negative impact on child development and maintenance.

CONCLUSION

Based on the results of the research and discussion above, several things can be concluded as follows The results found that 50% of toddlers who suffer from stunting and those who do not suffer from stunting as much as 50%. At the Madiun City Health Center, most toddlers have a female gender. Most toddlers at Puskesmas Kota Madiun have working mothers. At the Madiun City Health Center, most toddlers have mothers with higher education. Most of the families under five in Puskesmas Kota Madiun have income from ≥ MSEs in Madiun City. From the results of the study, it was found that there was no relationship between the level of maternal education and the incidence of stunting in toddlers at the Madiun City Health Center. From the results of the study, it was found that there was no relationship between the level of family income and the incidence of stunting in toddlers at the Madiun City Health Center. From the results of the study, it was found that there was no relationship between the level of maternal education and family income with the incidence of stunting in toddlers at the Madiun City Health Center.

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