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UTILIZATION OF CLEAN WATER, PERSONAL HYGIENE OF TODDLER CAREGIVERS, AND SMOKING BEHAVIOR OF FAMILY MEMBERS AS RISK FACTORS FOR CASES OF STUNTING TODDLERS

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Abstract

Introduction: *Pasuruan District was in the 7th rank of the highest stunting prevalence in the East Java Province (39.7%). Stunting cases that are not handled properly lead to the decrease of cognitive and motor skills, productivity, and even lead to death. One of the risk factors for stunting cases is a history of infection with toddlers (or children under five) from poor behavior of family and caregiver. The purpose of this study was to analyze the effect of clean water use, personal hygiene for toddler caregivers, and the smoking behavior of family members in cases of stunting toddlers in Pasuruan District.* ***Methods:*** *The research was conducted using a case-control design with a ratio of 1: 1. Sampling using stratified random sampling and the proportion of 2% of 2,718 toddlers. Toddlers with z-scores <-3SD – <-2SD became a case group of 118 and toddlers with z-scores ≥-2SD – 2SD became controls of 114.* ***Results and Discussion:*** *There was an effect between smoking inside the house (p = 0.004, OR = 0.473), dishes and drinking utensils washed with soap and running water (p = 0.029, OR = 2.726), washing hands with soap and running water by caregivers (p = 0.002, OR = 2.52), and cutting fingernails by caregivers (p = 0.006, OR = 0.544) on cases of stunting toddlers.* ***Conclusion:*** *Clean water utilization, personal hygiene of toddler caregivers, and the smoking behavior of family members are the risks in the incidence of stunting toddlers in Pasuruan District. The variable of dishes and drinking utensils washed with soap and running water is the highest risk (OR = 2.726) for cases of stunting toddlers in Pasuruan District. The food and drink utensils that are not washed properly and correctly will allow bacterial contamination which causes toddlers to become infected.*

INTRODUCTION

Environment causes deaths in the world by 23%, as well as deaths in children under five years of age by 26%. Infectious diseases caused by environmental factors are found in many developing countries with relatively lower incomes. Environment is divided into several components, namely physical, biological, and chemical which affect individuals and their behavior (1). Environment and humans have an intertwined relationship, for instance, not only the environment can affect humans' attitudes and behavior, but humans will also affect the environment from their attitudes and behavior (2).

Environmental health is important to apply in this case because it is a science that studies efforts to prevent disease in people from environmental factors without damaging the ecosystem itself. The Government Regulation of Republic Indonesia No. 66 Year 2014 about Environmetal Health has regulated quality standards from physical, chemical, biological, and social aspects consisting of water, air, land, food, facilities and buildings, vectors, and disease-carrying animals to create a healthy environment (3). Clean water is one type of water used for personal hygiene activities such as bathing, washing, watering plants (4). Improper clean water utilization, such as not washing dishes and drinking utensils, can contaminate food or drinks which leads to diarrheal infections (5-6).

The improper clean water utilization in Indonesian people is mostly caused by factors of poverty and unequal clean water services, thus the people with their limitations utilize other alternative water sources that are not useful. Previous research shows that 80% people in Semarang City still used groundwater, and only 60% people had access to clean water in Palembang City (2,7). Most people in Pasuruan District have middle to lower-income levels, thus allowing the clean water utilization which is not optimal as well.

The concept of H.L Blumm explains that besides the environment, behavior is the biggest determinant that affects public health status. This is following previous studies, smoking behavior has a relationship with the level of public health status (p = 0.001) which is marked by experiencing complaints of illness in the last 1–6 months (8). Smoking inside the house is unhealthy family behavior still often found in common people, and the other is not maintaining the cleanliness of both themselves as well as their home environment.

Clean and Healthy Living Behavior can be done to strengthen the capabilities of children and mothers which consist of several activities, including personal hygiene (bathing, cleaning the nose, washing hands with soap, cutting fingernails), and eating a balanced nutritious diet (9). All toddlers in Pasuruan District are taken care by their families or caregivers, thus it is important to adopt a clean and healthy lifestyle to infect toddlers because these activities can prevent scabies and reduce the risk of diarrhea disease by up to 27% (10–12). Family infections can be transmitted through the skin, respiratory tract, digestive tract, and genitourinary tract (13).

The risk factors for stunting in children under five are inadequate nutritional intake, disease infections, and family socioeconomic conditions (14). Infectious diseases can cause stunted toddlers because they reduce their toddler's appetite and disrupt the toddler's growth process (15–17). Besides, the nutritional status and health of mothers during pregnancy and childbirth can affect the growth and development of children from an early age. The World Health Organization (WHO) has formulated a stunting prevention strategy to meet its target by 2025, that is, a decrease in the stunting toddler incidence by 40%. These strategies include: 1.) improving the identification, measurement and understanding of stunting; 2.) providing policies or programs to improve the nutritional status and health of pregnant women, starting with adolescents; 3.) implementing interventions related to exclusive breastfeeding and the practice of weaning; 4.) strengthening the community to improve water quality, sanitation, and hygiene to protect their children from infectious diseases (18).

The use of clean water for washing dishes and drinking utensils properly can reduce the risk of stunting because using soap and running water for washing can reduce bacterial colonies that contaminate food and drinks for toddlers (15). Water that is used repeatedly in the washing process causes contaminants to collect in the water. In fact, the nutritional quality in high-nutrition toddler meals will still be able to reduce if contaminated with bacteria.

The implementation of personal hygiene for toddler caregivers is also a risk factor for the incidence of stunting toddlers. The worse the personal hygiene implementation for the caregivers, the higher the stunting risk as well (15,19-20). The relationship between the application of personal hygiene and the incidence of stunting in children under five is an indirect relationship and a determining factor for the quality of nutritional intake of children (21). The quality of nutritional intake for toddlers is determined by personal hygiene from the family and caregivers of toddlers because poor personal hygiene can contaminate food or drinks that cause toddlers to develop infectious diseases and reduce appetite and body fluids (15–17).

The results of previous studies indicated that smoking behavior, especially residents in the house, is a risk factor for families, especially toddlers with Acute Respiratory Infections (ARI). Toddlers are at the highest risk of contracting ARI because their immune system is still weak so that the agent easily attacks the body (22). Toddlers who have a history of ARI disease have a risk of stunting 3 times higher than children without a history of ARI (23).

Stunting is a disorder of height in toddlers who is not according to their age. Toddlers can be said to be stunted if they have a height < -2 SD, the WHO's median child growth standard (24). Based on the Indonesian Basic Health Research of 2018, the stunting prevalence in toddlers in Indonesia decreased in 2007 (36.8%), as well as in 2013 (37.2%) and 2018 (30.7%). Even though it has decreased, the stunting prevalence in Indonesia is still high (25).

The East Java Province has a fairly high prevalence of stunting among children under five (32.8%) in 2018 (26). Pasuruan District is in the 7th rank of the highest stunting prevalence in East Java Province (39.7%). This condition is a problem in Pasuruan District because it exceeds the average prevalence both at the provincial level (32.8%) to the national level (30.7%) (27). Data obtained from the Pasuruan District Health Office shows that the number of children under five with stunting in Pasuruan District touched 2,718 in the weighing month of February 2020. In Pasuruan District, this figure is not small and the case of stunting in children under five is a problem that cannot be underestimated so that it must be handled promptly.

Stunting cases that are left for a long time will have an impact on various sectors, including health, child development, and the economy. Poor toddler development will reduce cognitive and motor skills, reduce productivity and capacity and even cause death (14). This is also not following the goal of SDGs number 3, namely equitable health across all age groups (28). Therefor it is important to prevent the incidence of stunting by taking into account the risk factors. This study aims to analyze the effect of the use of clean water, the application of personal hygiene for caregivers, and the smoking behavior of the occupants on the incidence of stunting in Pasuruan District.

METHODS

This study was quantitative research to analyze the effects of clean water utilization, personal hygiene of caregivers, and smoking behavior of family members on cases of stunting toddlers. It is an observational study with a case-control design ratio of 1:1. The population in this study were children aged 0 to 60 months in Pasuruan District. The respondents were grouped based on the weight results in August 2020. The toddlers with z-score < -3SD – < -2SD belonged to the case group, while the toddlers with z-score ≥ -2SD – 2SD belonged to the control group. The analysis units of this study were housewives or the toddler primary caregivers. The number of stunting toddlers in Pasuruan District in the weighing month of February 2020 was 2718, obtained from the Pasuruan District Health Office. The stratified random sampling along with a proportion of 2% obtained the number of stunting toddlers which was 118, and the normal toddlers which was 114. The chosen location for the case group was the respondents who lived in the stunting locus areas based on the Decree of Pasuruan Regent. Meanwhile, the control group was the respondents who lived in areas with Low Sanitation Risk Index based on the mapping by the Pasuruan District Health Office in 2019. All data used in this study are primary data. The respondents' data collection was carried out by enumerators, primary health care sanitarians, and village health cadres through processes of in-depth interviews and observations. The tools used to collect data in this study were the in-depth interview guideline, and documentation tools.

The dependent variable in this study was the toddler status, namely stunting or normal. The independent variables analyzed were the age, family income, education, family members who smokes inside the house, daily cost of cigarettes, washing dishes with soap, washing dishes with running water, cutting fingernails and washing hands with soap. Age was the respondents' confession of the last birthdays that the respondents had passed, with the age categories of 17–26 years, 27–36 years, 37–46 years, and 47–56 years. Family income was the average gross income earned by a head of the family in each month, with the categories of <1 million, 1–2 million, 2–3 million, and >3 million. Respondent education was the last formal education that the respondents had passed, with the categories of Elementary School, Junior High School, Senior High School, Higher Education, and Not Graduated from School. Family members smoke inside the house is a habit of family members who smoked inside the house or in a closed room which was often used for activities by toddlers with the categories of Often, Sometimes, and Never. Washing toddler's dishes with soap and running water is the respondents' confession when washing dishes, glasses, or spoons for toddlers using soap with the categories of Always, Often, and Rarely. Caregivers washing their hands with soap and running water is the respondents' confession of washing their hands with soap before preparing food or drinks as well as feeding

the toddlers, with the categories of Always, Often, Rarely. Cutting nails is the respondents' confession to cut their fingernails once a week at maximum, with the categories of Always, Often, and Rarely. The statistical analysis used logistic regression to discover the effects of independent variables on the dependent variable using nominal and ordinal data scales. Each independent variable was analyzed to obtain complete information and to find out the relationship between each independent variable and the dependent variable. This study has been approved by the Faculty of Public Health of Universitas Airlangga, and the Government of Pasuruan District.

RESULTS

There were 232 respondents in this study, and they were the family or caregivers who took care for toddlers every day. This study shows that both in the control group and in the case group, 46.5% of the respondents were mostly aged 27 to 36 years. Most of the respondents' education level was relatively low, dominated by the case group, 28% graduated from elementary school, while the control group mostly graduated from junior high school (19.8%) and elementary school (19.0%). Most of the respondents' income in the case group was lower than the control group. In the case group, it was dominated by respondents who had income ranging from 1 to 2 million at 19.4%, then followed by respondents who had an income of <1 million at 16.8%. While the control group was dominated by respondents who had an income of around 2 to 3 million at 20.3% and followed by respondents who had an income of around 1 to 2 million at 19% (Table 1).

Table 1. Distribution of Respondents' Characteristics

Respondents' Characteristics	Toddler Status				Total (n=232)	
	Normal (n=114)		Stunting (n=118)			
	(f)	(%)	(f)	(%)	(f)	(%)
Age (years)						
17 – 26	34	14.7	43	18.5	77	33.2
27 – 36	56	24.1	52	22.4	108	46.5
37 – 46	19	8.2	22	9.5	41	17.7
47 – 56	5	2.2	1	0.4	6	2.6
Education						
Not attend schools	2	0.8	5	2.2	7	3.0
Elementary Schools	44	19.0	65	28.0	109	47.0
Junior High Schools	46	19.8	27	11.6	73	31.5
Senior High Schools	17	7.3	15	6.5	32	13.8
Tertiary Education (DI, DII, DIII, DIV/Bachelors, Masters, Doctoral Degree)	5	2.2	6	2.5	11	4.7
Income						
<1 million	15	6.5	39	16.8	54	23.3
1 – 2 million	44	19.0	45	19.4	89	38.4
2 – 3 million	47	20.3	26	11.2	73	31.5
>3 million	8	3.4	8	3.4	16	6.9

The independent variables in this study were smoking inside the house, washing dishes and drinking utensils with soap and running water, washing hands using soap and running water by caregivers, and cutting fingernails by caregivers (Table 2).

Table 2. Distribution of Personal Hygiene According to Toddler Status

Personal Hygiene Variable	Toddler Status				Total (n=232)	
	Normal (n=114)		Stunting (n=118)			
	(f)	(%)	(f)	(%)	(f)	(%)
Smoking inside the house						
Often	22	9.5	32	13.8	54	23.3
Sometimes	68	29.3	76	32.8	144	62.1
Never	24	10.3	10	4.3	34	14.7
Washing dishes with soap and running water						
Seldom	0	0.0	5	2.2	5	2.2
Often	29	12.5	31	13.4	60	25.9
Always	85	36.6	82	35.3	167	72.0
Washing hands with soap and running water by caregivers						
Seldom	0	0.0	27	11.6	27	11.6
Often	35	15.1	38	16.4	73	31.5
Always	79	34.1	53	22.8	132	56.9
Cutting fingernails						
Seldom	14	6.0	58	25.0	72	31.0
Often	42	18.1	29	12.5	71	30.6
Always	58	25.0	31	13.4	89	38.4

This study shows that the intensity of most smoking frequency inside the house was periodically, at 62.1%. In the variable of the behavior of washing dishes and drinking utensils, most dishes and drinking utensils were washed with soap and running water (72%). In the variable of the behavior of washing hands using soap and running water, most toddler caregivers always washed their hands with soap and running water at 56.9%. It can be concluded from these two variables that the personal hygiene implementation for the family and toddler caregivers was good enough. It was found that the

behavior of cutting fingernails by caregivers in the control and case groups in this study was inversely related. As many as 25% of caregivers in the case group rarely cut their fingernails, and as many as 25% of caregivers in the control group always cut their fingernails.

Table 3. Analysis of Final Logistic Regression

Personal Hygiene Variable	P	Odd Ratio	Lower Bound	Upper Bound
Smoking inside the house	0.004	0.475	0.287	0.786
Washing dishes with soap and running water	0.029	2.726	1.108	6.706
Washing hands with soap and running water by caregivers	0.002	2.52	0.108	0.592
Cutting fingernails by caregivers	0.006	0.544	0.354	0.838

The results of statistical analysis test using logistic regression indicated that all the variables studied: smoking in the house, washing dishes and drinking utensils with soap and running water, washing hands with soap and running water by caregivers, cutting fingernails by caregivers, they were significantly associated with stunting ($p<0.05$). Each of them had a direct proportion of the relationship and became a risk factor for stunting, with the OR values of 0.475, 2.726, 2.52, and 0.544. This study shows that the variable of washing dishes with soap and running water had a greater risk level than the other variables studied (Table 3). Based on the results of statistical analysis test carried out, the personal hygiene implementation for the family and toddler caregivers had a relationship with the incidence of stunting toddlers in Pasuruan.

DISCUSSION

Utilization of clean water for washing dishes and drinking utensils for children under five is the highest risk for the incidence of child stunting in Pasuruan District. This is shown in the results of the logistic regression statistical analysis of drinking utensils washed with soap and running water has an influence on the incidence of stunting in children under five ($p = 0.029$) and has an OR = 2.726, which means that drinking utensils that are not washed with soap and running water are at risk of stunting for children under five, 2.726 times greater than drinking utensils washed with soap and running water. Respondents in this study were still found to be quite a lot of 29.9% who often and 5 respondents rarely washed dishes utensils for toddlers using running water only using soaking water in the tub. According to research respondents, washing utensils using soaking water as long as using soap alone is sufficient and this can save the use of clean water due to limited costs and available sources of clean water.

This study is in line with research conducted in the working area of the Simolawang Primary Health Care in Surabaya, which shows that 75.8% cases of stunting toddlers are taken care by toddler caregivers who are still poor in maintaining the cleanliness of cutlery (15). The correct technique for washing dishes and drinking utensils can reduce the number of *Escherichia coli* bacteria colonies by up to 99.972%. Washing cutlery with immersed water was unable to reduce the number of bacterial colonies effectively because the bacteria were still present in the immersion water which was not streamed immediately (29). *Escherichia coli* is a bacterium that can be found in the environment, food, intestines of humans and animals. Toddler dishes contaminated with *Escherichia coli* can cause infection through the digestive tract so that toddlers can experience diarrhea, nausea, and stomach aches (30). A history of diarrheal infection has an increased risk of stunting in children under five because diarrhea infection in the long term can interfere with toddler height growth. Diarrhea in toddlers causes zinc to disappear in the toddler's body so that the diarrhea medicine given to toddlers contains zinc to renew and reduce the severity of diarrhea (17).

Apart from being contaminated by bacteria collected in the soaking water, the chemicals from the dish soap will also collect in the soaking water which can cause an irritating effect on the skin. Dish soap that doesn't contain plant extracts has a higher pH than one that contains plant extracts. The higher the pH in the solution, the higher the risk of skin irritation (31). Therefore, it is important to drain water so as not to pose a health risk to both stunting toddlers and skin washing dishes and drinking utensils.

The activity of maintaining cleanliness is not only washing dishes and drinking utensils but washing hands which is also included in the Clean and Healthy Living Behavior Program. The results of interviews and personal hygiene observations of toddler caregivers found that 56.9% of caregivers always wash their hands with soap, so it can be concluded that only some of them have implemented this program. The results of statistical analysis using logistic regression of caregivers washing hands with soap and running water had a significant relationship with the incidence of stunting in children under five with a value of $p = 0.002$ and an OR = 2.52, which means that caregivers who do not wash their hands with soap and running water are 2.52 times more likely to be stunted under five than caregivers who wash their hands with soap and running water. Respondents thought that washing hands only using water was clean, it can be seen that 27 respondents who rarely washed

their hands properly were in the case group, this was also found in research respondents in Bondowoso and Samarinda (32-33). One of the characteristics of bacteria is that they are very small in size beyond the limits of human vision so that their existence cannot be predicted with certainty.

Washing your hands using soap is more effective at reducing the number of bacteria on your hands than using only water (p<0.071) (34). Other studies related to the effectiveness of handwashing soap on the number of bacteria in the ICU of District General Hospital of Dr. H. Abdoel Moeloek, that the number of bacteria on the hands was significantly reduced after washing hands with soap (p = 0.001) (35). Before washing hands, the total number of *Escherichia coli* germs on the hands was 432 colonies. *Triclosan* is a liquid substance that has been registered with the Food and Drug Administration as an ingredient in antiseptic detergents. Hand washing soap containing *triclosan* can inhibit the growth of bacteria, especially *Escherichia coli*, which can cause diarrheal infections. The higher the concentration, the greater the ability to inhibit bacterial growth. The decrease in the number of bacteria after washing with antiseptic soap containing these substances can reduce the germ rate by 96.18% (36).

The results of this study are in line with previous studies that indicate improper and infrequent handwashing habits are a risk factor for stunting (20-21,32,37). This can occur due to contamination from the caregiver's hands to the toddler's food so that the toddler gets infected with an infection. History of infectious disease in children under five is a risk factor for the incidence of stunting under five (15–17). Different results were found in research conducted in the work area of Primary Health Care of Harapan Baru, Samarinda, that the behavior of mothers washing their hands with soap was not a risk factor for stunting toddlers because the quality of the washing hands of mothers in the case and control groups were not too different, and there were other factors such as sanitation facilities and occupants' behavior that had a greater OR value (31.875 and 18.417) than the OR value of the mother's hand washing quality (3.923) (33). Improving the quality of handwashing in the Water, Sanitation, and Handwashing (WASH) program can reduce stunting cases in toddlers. However, the WASH program alone is not sufficient to eliminate stunting, it requires a comprehensive strategy involving various parties so that stunting can be eliminated (38).

Apart from washing hands with soap and running water, another application of personal hygiene is cutting fingernails. Observations on the research respondents that most of the caregivers of toddlers' nails in the case group were still long and according to his admission, 58 respondents were rare to cut their nails. The results of statistical analysis using logistic regression, caregivers cutting fingernails had a significant relationship with the incidence of children under five with a value of p = 0.006 and had a value of OR = 0.544, which means that caregivers who do not cut their fingernails have a risk of under-five to experience stunting 0.544 times greater than caregivers who cut their fingernails. Cutting fingernails is activity that must be done at least once because it will become a place for germs and cause scratches (9). Fingernails are a place for microbes to stick, especially fungi and worms due to activity after scratching the infected skin or after defecation. If the toddler's caregiver does not cut his fingernails, the worms that stick to the toddlers' fingernails will be swallowed by the toddler during the process of making food and feeding the toddler, causing the toddler to have intestinal worms (39-40). Worms can inhibit the growth and development of children under five because the nutritional status of toddlers is reduced due to weak resistance so that the toddler's body is vulnerable to other infectious diseases (40). This is different from the results of previous studies, namely the habit of cutting fingernails is not a risk factor for the incidence of stunting in toddlers in Banten because all respondents cut their fingernails in the case and control groups so that the stunting of children under five was influenced by other factors (37).

The behavior of residents smoking in the house violates the Regulation of Ministry of Health of Republic Indonesia No. 1077/MENKES/2011 about Guidelines for Air Conditioning in the House because it is not following the goal of creating good air quality so that it cannot cause health problems to families, especially toddlers. Chemicals from smoking activities are pollutants that do not easily disappear because of their properties that can stick in various places. Cigarette smoke contains chemicals that are harmful to health, including Sulfur dioxide (SO_2), Nitrogen dioxide (NO_2), Carbon monoxide (CO), Carbon dioxide (CO_2), Volatile Organic Compounds (VOC), and Polycyclic Aromatic Hydrocarbons (PAHs) (41). Smoking can make it difficult for women to get pregnant and can have health effects on fetuses and babies. Smoking can increase the risk of premature birth, fetal death in the womb, and low birth weight (LBW) (42).

The results of the statistical analysis test show that the variable of smoking inside the house has a relationship with the incidence of stunting in toddlers and has a value of OR = 0.475 which means that family members who smoke indoors have a risk of causing toddlers being stunted 0.475 times greater than smoking

outdoors. The variable of smoking inside the house had a smaller OR value compared to other variables since the comparison of the number of smoking family members inside the house of the case and control groups was not much different. Smoking behavior inside the house can cause diseases in the family members in the house, especially toddlers. Research conducted in Manado City found that smoking behavior inside the home caused toddlers to have ARI (p = 0.002), this was because the immune system in toddlers is still low, thus the toddler's body cannot respond perfectly (22). Toddlers who have a history of ARI disease can cause them to be stunted according to research conducted in the work area of the Rejosari Primary Health Care (p = 0.001) and Sampang (p = 0.029) due to the inflammation they experience, therefore they cannot digest food properly (17, 23).

The effects of the variable of smoking inside the house not only come from the smoke of the cigarettes, but also from the costs of buying cigarettes by reducing the costs that is needed for the toddlers' growth and development (43). The results of the in-depth interviews that have been conducted show that most respondents have a relatively low monthly income of around 1 to 2 million, so it is very important to manage finances for expenses. Previous research conducted in Gorontalo showed that the expense of cigarettes in families of children under five with stunting was greater than in families of normal children under five and there was a significant difference between the two variables p = 0.036. The higher cost of cigarettes for stunting families of children under five causes fewer costs to fulfill the nutritional intake of children under five, which is a risk factor for stunting among children under five (44). If the smoker costs Rp 15,000 to buy a pack of cigarettes in one day, so in one month it costs Rp 450,000. Compared to the income most respondents get per month is 1–2 million, almost 20% of the cost of income is spent on consuming cigarettes.

The weakness in this study is the lack of specificity in the activities of caregivers to wash their hands with soap after defecation, before serving food, when giving food to toddlers. Besides, this study also did not examine the personal hygiene of toddlers, either washing their hands with soap or cutting their fingernails because several toddlers can play in the yard of the house so this is a possible risk factor for the incidence of stunting in Pasuruan.

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CONCLUSION

The results of the research that have been carried out can be concluded that most of the use of clean water and personal hygiene of caregivers has been done well. However, there is still bad behavior, namely the smoking behavior of residents in the house. The behavior of residents smoking in the house can reduce the air quality in the house and increase the risk of family diseases. The behavior of smoking residents, the application of personal hygiene for caregivers, and the use of clean water is a risk in cases of stunting in children under five in Pasuruan District. Each of the variables studied had a relationship with the incidence of stunting in children under five, including smoking in the house, washing drinking utensils with soap and running water, caregivers washing their hands with soap and water, caregivers cutting fingernails. The habit of washing dishes and drinking utensils using soap and running water is the highest risk factor in the incidence of stunting toddler (OR = 2.726), for the improper and incorrect ways of washing dishes and drinking utensils can allow bacterial contamination that causes toddlers to be infected. Therefore, it is necessary to pay attention to families and caregivers of toddlers to further improve the habit of applying personal hygiene as a preventive measure for stunting cases in toddlers. Besides, the local government has assigned the competent authority to provide education to the local community regarding clean and healthy living habits as an action to reduce the incidence of stunting in toddlers in the local area and immediately follow up on cases of stunting in toddlers for a better generation of the Indonesian nation.

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