

Hubungan Penyakit Infeksi dan Praktik Higiene terhadap Kejadian Stunting Pada Balita Usia 24-59 Bulan

Association between Infectious Disease and Hygiene Practice on Stunting Toddler Aged 24-59 Months

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ABSTRAK

Latar Belakang: Masalah gizi balita masih menjadi permasalahan kesehatan utama di Indonesia. Masalah kekurangan gizi juga dapat diketahui dari lambatnya pertumbuhan anak, salah satunya dalam hal panjang atau tinggi badan. Kondisi dimana panjang atau tinggi badan seorang anak tidak optimal disebut dengan stunting. Kejadian stunting dipengaruhi oleh beberapa faktor langsung maupun tak langsung seperti penyakit infeksi dan praktik higiene.

Tujuan: Penelitian ini untuk mengetahui pengaruh infeksi dan praktik higiene terhadap kejadian stunting pada balita berusia 24 - 59 bulan di wilayah kerja Puskesmas Bulak Banteng, Surabaya.

Metode: Penelitian ini menggunakan metode observasi dengan desain penelitian case control. Subjek yang diamati terbagi menjadi dua kelompok yaitu kelompok kasus dan kelompok kontrol. Kelompok kasus merupakan kelompok balita stunting dengan rentang usia 24-59 bulan dan kelompok kontrol yaitu balita non stunting/normal berusia 24-59 bulan. Jumlah sampel penelitian masing-masing sebanyak 28 kasus, baik stunting maupun non stunting. Penelitian dilaksanakan di wilayah kerja Puskesmas Bulak Banteng, Surabaya mulai bulan Januari – Mei 2019. Pengumpulan data dilakukan dengan mengumpulkan kuesioner terkait karakteristik keluarga dan balita, serta kuesioner terkait penyakit infeksi maupun praktik higiene yang dilakukan dengan metode wawancara serta observasi dengan kuesioner praktik higiene, pengukuran tinggi badan.

Hasil Ulasan: Hasil penelitian menunjukkan bahwa ada pengaruh antara penyakit infeksi ($p=0,000$) ($OR=-3,402$), dan praktik higiene ($p=0,000$) ($OR=-2,442$) terhadap stunting.

Kesimpulan: Terdapat hubungan yang signifikan antara penyakit infeksi dan praktik higiene dengan kejadian stunting pada balita usia 24-59 bulan (di wilayah kerja Puskesmas Bulak Banteng, Surabaya).

Kata Kunci: Balita, Penyakit Infeksi, Praktik Higiene, Stunting

ABSTRACT

Background : Child nutrition problem is still a major health problem in Indonesia. Toddlers are a period where children experience rapid growth and development, so they need a high nutrient. The problem of malnutrition can be identified from the children's slow growth, one of which is in terms of body length or height. A condition where a children's length or height is not optimal is called stunting. The incidence of stunting affected by several factors, such as infectious disease and bad hygiene practices.

Methods: This study used an observation method with a case control research design. The subjects of research were divided into two groups, namely the case group and the control group. The case group is a group of children under five with stunting with an age range of 24-59 months and a control group, namely a non-stunting / normal toddler aged 24-59 months. The number of samples in each study was 28 cases, both stunting and non-stunting. The research was conducted in the work area of Bulak Banteng Health Center, Surabaya from January - May 2019. Data collection was carried out by collecting questionnaires related to family and toddler characteristics, as well as questionnaires related to infectious diseases and hygiene practices which were carried out using the interview method and observation with the hygiene practice questionnaire and measurement height.

Results: The result showed that there was an influence between the incidence of infectious disease ($p=0,000$) ($OR= -3.402$), and hygiene practices ($p<0.001$) ($OR= -2.442$) on stunting.

Conclusion: The conclusion in this study is that there is a significant relationship between infectious diseases and hygiene practices with the incidence of stunting in toddler aged 24-59 months in Bulak Banteng Health Center, Surabaya.

Keywords: Hygiene Practices, Infectious Disease, Stunting, Toddlers



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INTRODUCTION

Nutritional status is one of the important factors that can affect the health level of children under five, because the age of five is a period in which the growth and development of the body continues which must be supported by the intake of nutritious food. If the nutritional intake that is consumed is in accordance with the body's needs, then the toddler will have a good nutritional status. Conversely, if a toddler's nutritional intake is less / more, it cannot be said that the person has less or more nutrition ¹. The toddler period is a golden period in the development of a child. During the toddler years, there is a very rapid development and growth, both physically and mentally. Thus, toddlers really need adequate nutritional intake to support all their activities. But unfortunately, toddlerhood is also a time when a child is prone to experiencing nutritional problems. One of the factors that can affect this condition is due to the limited knowledge of mothers about the importance of providing good nutrition ².

The problem of malnutrition can be identified from the slow growth of a toddler, such as from his length or height. The condition in which the length or height of a toddler is not normal is called stunting. This of course will have a negative impact on the growth and development of children in the future. For example, slow growth during toddlerhood can affect brain intelligence after adulthood. Based on previous research, it was found that the incidence of stunting in children aged 24 months was due to the fact that the toddler was included in the toddler group with malnutrition at the age of 12-24 months or earlier ³. In addition, low nutritional intake is also known to cause limited production of antibodies in the body. so that malnourished toddlers tend to get sick more easily. This of course can result in an increase in morbidity and mortality among children under five ⁴. According to the World Health Organization (WHO), chronic malnutrition in the period of growth and development since the beginning of the toddler's life is a description of stunting ⁵.

Basic Health Research Data (Riskesdas) for 2010-2018 states that the prevalence of stunting under five in Indonesia is still fluctuating. The prevalence of stunting under five in Indonesia in 2010 was 35.6%, in 2013 it was 37.2%, and 2018 was 30.8%. For the East Java region itself, of the total population of children under five in East Java, the prevalence of stunting is 26.7% ⁶. The prevalence of stunting under five will still be a public health problem if the prevalence is $\geq 20\%$. If you look at the Riskesdas data, the number of cases of stunting under five in Indonesia is still high and is one of the health problems that must be resolved immediately ⁶.

The direct cause of stunting in children under five, apart from food intake, is an infectious disease ⁷. One of the factors that can affect the growth of children under five is the presence of acute and chronic infections. This condition can inhibit linear growth by decreasing appetite, absorption of nutrients, loss of nutrients, and others. Toddlers who have had an infection are prone to experiencing malnutrition and if this condition is allowed, they will be at risk of experiencing stunting. If this condition is repeated, it will have an impact on the growth and development of toddlers, namely by decreasing body weight.

Infectious diseases are related to hygiene practices, so hygiene and sanitation practices also need attention. Indirectly, hygiene behavior factors have a major influence on nutritional problems, especially stunting. Toddlers who eat foods with poor hygiene practices are at risk of contracting infectious diseases. Health care for toddlers must be carried out optimally so that the possibility of toddlers experiencing infectious diseases will be low. The mother of a toddler must maintain a clean body, food and home environment. This is because toddlers can avoid infectious diseases that are commonly experienced by most toddlers, such as diarrhea and ARI. Both of these diseases have a direct effect on the nutritional status of children under five.

The purpose of this study was to determine the effect of infection and hygiene practices on the incidence of stunting in toddlers aged 24 - 59 months in the Bulak Banteng Community Health Center, Surabaya.

METHODS

This research was included in the type of analytic observational research where observations were made but without giving treatment or intervention to the respondent. This research design used a quantitative design. This research is included in the type of case control research. The research was conducted in the working area of Bulak Banteng Health Center, Surabaya from January - May 2019. The research population studied was all toddlers who were registered at the Bulak Banteng Health Center, and the sub-population was toddlers aged 24-59 months as of March 2019.

There were two types of samples used in this study which were the case sample and the control sample. The case sample is a sample with the criteria for children aged 24 - 59 months who suffer from stunting (Z-score $< -2SD$ - $< -3SD$) as many as 28 samples. Meanwhile control sample is a sample with criteria for children aged 24 - 59 months with the category of normal height / not stunting (Z-score $-2SD$ - $2SD$) as many as 28 samples. The sampling method was



carried out by simple random sampling technique where each sample that met the inclusion criteria was the toddler whose height could be measured and the toddler who was predominantly cared for by the mother.

The data collected by researchers was primary data which includes the characteristics of children under five, family characteristics, and hygiene practices. Data collection techniques related to the characteristics of children under five, family characteristics, and infectious diseases is to use a questionnaire with the method of interviewing the respondent's mother / toddler. Data collection related to hygiene practice variables was also carried out by interview and observation. Interviews were conducted using a questionnaire consisting of 36 questions regarding points of hygiene practice that will be processed using a scoring technique consisting of 36 questions to classify good or bad. The independent variables in this study were infectious diseases, hygiene and sanitation practices. Infectious disease variables include the type, frequency, and duration of infectious diseases suffered in the last 3 months. The types of infectious diseases were diarrhea, ARI, and ISPA, flu, and others. Other than that, the

dependent variable is the incidence of stunting where nutritional status refers to the height index according to age (height / age). The data analysis used was binary logistic regression test with the SPSS v20 application with the aim of analyzing the effect of infectious disease incidence and hygiene practices on the incidence of stunting in under-fives 24 - 59 months at Bulak Banteng Health Center, Surabaya. This research has received approval from the Health Research Ethics Commission (KEPK) Universitas Airlangga with the ethical certificate number 177 / EA / KEPK / 2019.

RESULTS AND DISCUSSION

Toddlers Characteristics

The characteristics of children under five taken in this study included toddler age (24-36 months, > 36-48 months, > 48-60 months), gender (male or female), birth weight (stunting or normal), length and weight. body (deficient or normal). The distribution of the characteristics of these toddlers can be seen in Table 1.1:

Table 1.1 Toddlers Characteristics

Characteristics of Toddlers	Stunting		Non-Stunting	
	N	%	N	%
Age (Months)				
24-36	13	46.4	10	35.7
> 36-48	12	42.9	14	50
> 48-60	3	10.7	4	14.3
Gender				
Man	11	39.3	10	35.7
Women	17	60.7	18	64.3
Birth Weight				
LBW	21	75	13	46.4
Normal	7	25	15	53.6
Body Length of Birth				
Less (<48 cm)	8	28.6	4	14.3
Normal (≥48 cm)	20	71.4	24	85.7
Incidence of Infectious Diseases				
Yes	25	89.3	6	21.4
Not	3	10.7	22	78.6
Total	28	100	28	100
Duration of Infectious Disease				
0 days	3	10.7	22	78.6
1-2 days	1	3,6	0	0



Characteristics of Toddlers	Stunting		Non-Stunting	
	N	%	N	%
3-4 days	9	32.1	3	10.7
> 4 days	15	53.6	3	10.7
Total	28	100	28	100
Types of Infectious Diseases				
Painless	3	10.7	22	78.6
Diarrhea	12	42.9	3	10.7
ARI	5	17.9	1	3,6
Diarrhea and ARI	1	3,6	0	0
Flu	6	21.4	2	7,1
Tuberculosis	1	3,6	0	0
Total	28	100	28	100

Based on Table 1.1, it can be seen that the most stunting group of children under five was in the age range 24- <48 months (46.6%). Meanwhile, the most non-stunting children aged > 36-48 months were 50%. This showed that at this age, most toddlers no longer consume breast milk (ASI) and there is a high increase in interactions outside the home, where toddlers will be more at risk of being exposed to the outside environment that can cause infectious diseases. The high interaction with the outside environment results in toddlers being susceptible to infectious diseases which lead to weight loss⁸. Toddlers will also experience several lifestyle changes such as changing their diet from consuming only breast milk to solid foods.

The results also showed that the distribution of children under five by sex showed most stunting and non-stunting children under five were female (60.7% and 64.3%, respectively). This research was supported by a similar study in Ghana which concludes the risk of experiencing nutritional problems is more common in girls than boys. This phenomenon occurs due to differences in the way of care which "prioritizes" boys over girls⁹.

For the aspect of low birth weight (LBW), it was found that the most cases of LBW occurred in stunting under five, around 75%. For normal birth weight, most of the children were not stunting around 53.6%. Birth weight has a relationship with long-term growth and development of children under five. According to the Ministry of Health, the standard of body weight for normal newborns is between 2500 – 3000 grams¹⁰. The results of this study were in line with Wiyogowati's research, where toddlers with a history of low birth weight (LBW) were more likely to be stunting. This happens because the baby in the womb does not get the fulfillment of various needs such as adequate nutrition and a good mother's diet, as well as the intensity of the frequency of suffering from frequent illnesses³.

From the aspect of toddler body length, the standard used is the standard from the Ministry of Health which states that babies with normal birth bodies are 48 – 52 cm

in length¹⁰. Based on Table 1.1, it can be seen that the length of the birth body for the under-fives which shows the less category of stunting was 28.6%, while the non-stunting under five was 14.3%. The results of this study were also supported by other studies which show that the proportion of children under five with a long history of birth is more in the stunting group of children under five. This showed that babies who were born with a long birth bodies are less malnourished in the womb. Lack of nutrients since the womb has an effect on fetal growth (Siagian, 2019).

The results showed that the incidence rate of infectious diseases had an effect on the incidence of stunting ($p < 0.001$). This is due to the dense and unsanitary conditions of the living environment, which can increase the risk of infectious diseases. In addition, maternal hygiene practices have a major influence on the risk of infectious diseases. The results of this study are in line with research by Anshori (2013) which concluded that children under five with a history of infectious diseases such as diarrhea have a four times greater risk of experiencing stunting. The big risk analysis obtained an OR value of -3,420 which indicates that under-fives who do not experience the incidence of infectious diseases will reduce the risk of stunting by 3,420 times compared to toddlers who experience the incidence of infectious diseases¹².

Based on the table above, the results showed that the group of children under five who did not experience an infectious disease in the last three months was 10.7%, while the group of children under five who were not stunting was 78.6%. Most of the stunting children under five had diarrheal infectious disease with a percentage of 42.9%. Meanwhile, the non-stunting under five who experienced diarrhea was 10.7%. This disease caused by the presence of enteropathogenic bacteria *escheria coli* as the impact of poor hygiene practices. This was evidenced by the results of interviews which show that most mothers of toddlers give snacks carelessly with unclear hygiene to their children. Toddlers who have a history of diarrhea have a 7.46 times



higher risk of experiencing stunting compared to toddlers who do not experience diarrhea¹³.

The proportion of children under five who experienced an infectious disease within the last three months with a duration of illness of 1 – 2 days was more in the stunting under-fives group, around 3.6%, with a length of illness 3 – 4 days was 32.1%, and with duration of illness > 4 days around 53.6%. The results showed that the duration of illness had an effect on the incidence of stunting ($p = 0.000$).

Based on the results of the interview, it was known that the cause of the illness duration experienced by toddlers was the response of the mother who was less alert in responding to the condition of her child who was sick. The mother did not immediately give treatment to her child but wait for 1-2 days to find out whether the child's condition was getting worse or not, so that the duration of the child illness was getting longer.

The big risk analysis obtained an OR value of -3.602, meaning that underfives who did not experience the incidence of infectious diseases would reduce the risk of stunting by 3.602 times compared to toddlers who had an infectious disease of certain duration.

Family Characteristics

Family characteristics studied in this study include family income and mother's education level. The number of research subjects involved in this study were 56 people, 28 respondents from the stunting case or under-five group and 28 respondents from the control or non-stunting group. Family income in this study is the total amount of rupiah earned by all family members per month. Family income was divided into low income family (<Rp 3,871,000) and high income family (\geq Rp 3,871,000). The distribution of family income groups can be seen in Table 1.2:

Table 1.2 Distribution of Stunting and Non-Stunting Family Characteristics of Toddlers

Family Characteristics	Stunting		Non-Stunting	
	N	%	N	%
Family Income				
Low income family	24	85.7	16	57.1
High income family	4	14.3	12	42.9
Total	28	100	28	100
Mother's Education Level				
Graduated from elementary school	19	67.9	14	50
Graduated from junior high school	7	25	5	17.9
Graduated from high school	0	0	6	21.4
Graduated from College	2	7,1	3	10.7
Total	28	100	28	100

Based on Table 1.2, the number of low income family is higher than high income family. This is indicated by the large percentage of low income family, was 85.7% (families of children under five with stunting) and 57.1% (families of non-stunting children under five). Meanwhile, the percentage of high income family was 14.3% (families of children under five with stunting) and 42.9% (families of non-stunting children). From these data, it was known that the average income of stunting under-five families with low income is Rp. 2,746,428, while the average income for non-stunting families is Rp. 3,925,000. Low income is related to the source of income in the family only from the father, while the mother of the toddler is only a housewife. In addition, most of the mothers under five have graduated

from elementary school, so their ability to increase family income is limited. The results of this study are in line with research by Aridiyah et al (2015) which showed that families of children under five with stunting have a low income. Family income is one of the factors that can affect economic status¹⁴. Low economic status has an impact on the parents inability to buy adequate food and low purchasing power¹³. The low purchasing power of food can result in a lack of the amount of food and a limited variety of foods, especially food sources of nutrients (protein, vitamins, minerals) which are useful for the children growth. Low purchasing power can also increase the risk of malnutrition, such as the incidence of stunting¹⁵.



Mother's education is also one of the characteristics of the families studied. Maternal education was viewed from the mother's last education level which was divided into elementary / equivalent, secondary / equivalent, high school / equivalent, and tertiary education. Based on Table 1.2, the percentage of mother's education level with stunting who graduated from elementary school is the highest among the others, which is 67.9%. This shows that on average, mothers under five have a low level of knowledge. Meanwhile, the percentage of non-stunting mothers with primary school graduation category is 50%. This represents more than half of the total non sample-stunting has low knowledge. Mostly, mothers of children

under five are married at a young age, so that many of them do not continue their education to a higher level. Basically, parental education can affect the ability to access information and knowledge related to parenting. Inappropriate parenting might have an impact on poor food intake and in the end, it will affect the growth of children under five. Low maternal education can increase the risk of poor nutritional status in children. The mother's role is very influential for the child nutritional status. There are three important components (food, health, and psychosocial stimuli) which support optimal child growth¹⁶.

Table 1.3 List of Hygienic Practices for Stunting and Non-Stunting Mothers of Toddlers Group

Hygiene Practices	Stunting		Non-Stunting	
	n	%	N	%
Home and Environmental Practices				
Children's feces are thrown into the toilet	28	100	28	100
Family members defecate in the latrine	28	100	28	100
Closed RT landfills	28	100	28	100
Mother's Hand Washing Practices				
Before preparing food	28	100	28	100
Before feeding the child	28	100	28	100
Wash your hands using soap and water	6	21.4	8	28.5
Children's Handwashing Practices				
Before eating	28	100	28	100
After defecating or stool	28	100	28	100
Using soap and water	6	21.4	8	28.5
Food Preparation				
The source of food is self-cooking	28	100	28	100
Cook special meals for children	0	0	2	7,14
Storage of food before eating ≤ 1 hour	0	0	20	71.4
Reheat food each time before giving it to children	0	0	20	71.4
Provide warm or warm food to children	0	0	20	71.4
Cleanliness of Cutlery				
A place to wash cutlery in the house	10	35.7	28	100
Washing cutlery under running water	10	35.7	28	100
The frequency of changing the water in the collection bucket every time you wash the cutlery	10	35.7	28	100



Hygiene Practices	Stunting		Non-Stunting	
	n	%	N	%
Source of Water and Drinking Water				
Source of tap water	28	100	28	100
Treatment of drinking water using branded refilled water	28	100	28	100
Food Buying Habits				
Not often buying food on the roadside	8	28.5	26	92.8
Buy hot food from outside	8	28.5	26	92.8
The food given to the child is still hot	8	28.5	26	92.8
When the food is still hot, the food is eaten immediately	8	28.5	26	92.8
Don't buy snacks often	8	28.5	26	92.8
Purchased snacks packaged	8	28.5	26	92.8
The habit of using drinking utensils				
Giving drink using a glass	28	100	28	100
Glass washed with dish soap	28	100	28	100
Glass in clean condition	28	100	28	100

Source: ¹⁷

Based on Table 1.3, it can be analyzed that there are differences in several hygiene factors that are carried out well in the stunting and non-stunting toddlers, such as the practice of washing mothers' hands, washing children's hands, preparing food, cleaning cutlery, and the habits of mothers buying food. From these factors, it can be seen that different variables are found in the factor of maternal hand washing with the variable of washing hands using soap. Food preparation factors include the variables of cooking special meals for children, storing food ≤ 1 hour, reheating food each time before it is given to children, giving warm or hot food to children. The cleanliness factor of cutlery includes variables where to wash cutlery at home, wash cutlery with running water, the frequency of changing the water in the collection bucket every time you wash cutlery. The habit of buying food includes the variables of not often buying food on the side of the road, buying spicy food from outside, the food given to children is still hot, when the food is still hot, the food is eaten immediately, not often buying snacks, snacks that are bought packaged.

This study also concluded that the risk of stunting in toddlers can be reduced by good hygiene practices. If you always practice washing your hands with soap after each defecation, the risk of stunting will decrease by 14% and

if you always apply washing your hands with soap when feeding your children, the risk of stunting will decrease by 15% ¹⁸.

The results showed that there was an influence between hygiene practices and stunting. This happened because the large number of mothers under five who have not implemented good hygiene practices. It has an impact on the quality of food intake consumed by toddlers. The practice of washing hands of mothers and children who do not use soap when eating food and the food storage more than one hour will increase the risk of bacterial contamination. Washing cutlery outside the home and not using running water will increase the opportunity for microorganisms to survive and even grow more and more ¹⁹. Food that is not safe to be consumed by children because of poor food handling, such as the tools used to prepare, process, cook and serve unclean food, and food is left too long in an environment where the temperature has the potential for the proliferation of various microorganisms. This can increase the risk of toddlers experiencing infectious diseases which are usually characterized by appetite disorders, vomiting, or diarrhea. So that this affects the intake of children under five and ends in conditions that will have a negative impact on their growth ²⁰.

The Effect of Hygiene Practices on Stunting Incidence

Hygiene practices are closely related to personal hygiene such as the habit of washing hands with clean water and soap and washing dishes and cooking utensils with running water. The method of hygiene assessment is

by conducting interviews with the help of questionnaires and observations which will be grouped into two, namely good (> 19), bad (≤ 19) ¹⁷. The distribution of hygiene practices can be seen in Table 1.4:



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Table 1.4 Distribution of Stunting and Non-Stunting Toddler Hygiene Practices

Hygiene Practice Category	Stunting		Non-Stunting		p-value	OR
	n	%	N	%		
Bad	23	82.1	8	28.6		
Good	5	17.9	20	71.4	0,000	-2,442
Total	28	100	28	100		

Based on Table 1.5, it is known that most of the stunting children (82.1%) have poor hygiene practices, while the majority of non-stunting children (71.4%) have good hygiene practices. The results also stated that hygiene practices had an effect on the incidence of stunting ($p = 0.000$). The big risk analysis obtained an OR value of -2.442, meaning that good hygiene practices will reduce the risk of stunting by 2.442 times compared to bad hygiene practices.

Suggestions that can be given are that the Bulak Banteng Health Center should provide insight into how to prevent infectious diseases and educate mothers of toddlers about healthy and hygienic living procedures, one of which is by introducing the practice of washing hands with soap (CTPS) and the importance of using clean water that flows in every time. daily processes / activities. If deemed necessary, monitoring and control steps can also be taken, as an effort to discipline mothers of toddlers in getting used to proper hygiene practices by washing hands with water and soap, providing warm food to toddlers, preparing special food for children that are suitable for

children. age, provide food to children with a shelf life of <1 hour, and wash cutlery using running water.

CONCLUSION

The conclusion of this study is that there is an influence between hygiene practices on the incidence of stunting with an OR = -2.442, which means that toddlers with good hygiene practices will reduce the risk of stunting by 2.442 times compared to toddlers with poor hygiene practices. As for the effect of infectious diseases on the incidence of stunting with an OR = -3.402, it means that toddlers who do not experience an infectious disease will reduce the risk of stunting by 3.402 times compared to toddlers who have infectious diseases.

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