Correlation Between Environmental Health and Stunting of Children Under Five Years Old in Puskesmas Balowerti Kediri City

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ABSTRACT

Introduction: Stunting prevalence in Indonesia is very high. Puskesmas Balowerti has the highest stunting prevalence in Kediri City, one of the focus locations. A healthy environment is one of the key interventions to reduce stunting. *Method:* This study uses a cross-sectional study with 110 samples, mothers and their children under five years old, who live in the area of the Puskesmas Baloweti, which fulfills inclusion and exclusion criteria. The independent variables are environmental health, and the dependent variable is stunting. The data collection method was conducted by using a questionnaire and height/length measurement, then analyzed using the Spearman Rank Correlation test. *Result:* There are 89 normal children (80.9%), 15 stunted children (13.6%), and 4 severely stunted children (3.6%). There are 87 children with inappropriate defecation behaviour (79.1%), 82 children with appropriate water sources (74.5%), 93 children with appropriate waste disposal (84.5%), 108 children with appropriate liquid disposal (98.2%), and 93 children's families with appropriate handwashing behaviour (84.5%). The Spearman Rank Correlation test showed no correlation (p>0,05) between environmental health and stunting of children under five years old in Puskesmas Balowerti, Kediri city (p=0,073). *Conclusion:* This research concludes that there is no correlation between environmental health and stunting because the data of this research are less varied. Further research needs to be done with a larger sample and more varied data.

Keywords: environmental health; defecation behavior; water sources; waste disposal management; liquid disposal management; handwashing behavior; stunting

INTRODUCTION

Healthy environment promotion by improving water, sanitation, and hygiene is one of the key interventions that can reduce stunting (1). In Indonesia, the sanitation and hygiene campaign strategy is divided into five pillars; stop open defecation, hand washing with soap, household drinking water management, household solid waste management, and household liquid waste management (2).

In 2020, 22 percent of children under five were stunted globally. The prevalence of stunting is 31,8 % in Indonesia (3). In 2018, a new threshold of stunting was established through the WHO-UNICEF Technical Advisory Group on Nutrition Monitoring.

When the prevalence of stunting is greater than or equal to 30%, it is very high (4). Based on the new threshold, the prevalence of stunting in Indonesia is very high. The prevalence should decrease by 17.8% because the government's target is to reduce stunting the rate to 14% by 2024 (5).

According to the Keputusan Menteri PPN/ Kepala BAPPENAS Nomor Kep. 10/M.PPN/HK/02/2021, Kediri city is one of the focus locations for stunting (6). The prevalence of stunting in Kediri City until February 2020 is 10.9 %. Even though the prevalence of stunting in Kediri City is lower than in Indonesia, the prevalence of stunting in Kediricity increased by 0.3% from last year.

The prevalence of stunting in several Puskemas is also higher than the target for stunting. With the highest prevalence of stunting is 20% in Puskesmas Balowerti, Kediri City (7).

Indonesia is experiencing rapid urbanization. By 2025 it is expected that 67.5% of the country's population will live in cities. The cities will become more densely populated.

Challenges come with a high rate of urbanization. One of the challenges is meeting the need for good sanitation (8). Puskesmas Balowerti is also known as a densely populated area (7). With the high rate of urbanization, it also needs to manage good sanitation to prevent stunting in children.

In 2019, Kediri City was declared as open defecation free by the government (9). However, a study conducted in Kediri city about the condition of septic tanks with 100 respondents found that based on the construction type, size, and distance of the septic tank to the individual well, only 11%, 32%, and 20% of the respondents had septic tank complying with the national standard (10). For hand washing with soap, the prevalence was 63.3% in 2018 (11). The main source of water is mostly drilled wells about 83.98%, pipes about 0.24%, protected wells about 5.45%, and unprotected wells about 0.33%, in 2020 (12).

The correlation between a healthy environment and child nutrition has been found in some research. A healthy environment with safe drinking water resources was found to be significantly correlated with a child's nutritional condition (13). The environment with open defecation externalities is also found to be important for child health outcomes (14). However, cluster-randomized controlled trials enrolled in Kenya and Bangladesh found that there is no effect of water, sanitation, and handwashing groups on the linear growth of children (15,16).

Based on the explanation above, Kediri city is one of the focus locations of stunting, Puskesmas Balowerti has the highest prevalence of stunting in Kediri city; a healthy environment is one of the key interventions that can reduce stunting, and there was several contradictive research about the correlation between environmental health and nutritional status of children under five years old. The researcher is interested in conducting research to analyze the correlation between environmental health and the stunting of children under five years old in Puskesmas Balowerti in Kediri City.

METHODS
This study uses a cross-sectional study with 110 samples, mothers and their children under five years old, who live in the area of the Puskesmas Baloweti, which fulfills inclusion and exclusion criteria. The inclusion criteria are a mother who takes care of her children, children with normal birth weight, and children who have KMS (Kartu Menuju Sehat). The independent variable is environmental health. The environmental health consists of water source, defecation behavior, waste disposal management, liquid disposal management, and handwashing behavior. Those factors will be divided into appropriate and inappropriate. The appropriate criteria are in accordance with Kemenkes RI criteria. Then the variable will be combined into adequate and inadequate to evaluate the overall condition of environmental health. The dependent variable is stunting. The children were divided into four categories based on length/height-for-age (severely stunted, stunted, normal, and tall). Then the children will be divided into stunting and non-stunting children for data analysis.

The data collection method was conducted through interviews using a questionnaire and height/length measurement, then analyzed using the Spearman Rank Correlation test.

RESULTS
The total of respondents obtained was 110 respondents consisting of a mother and their babies. The study found that the youngest mother aged 20 years old and the oldest mother aged 53 years old. Most mother is young aged between 20-31 years old (52,7%). Most children are under three years old (64,5%) with 2 months old as the youngest and 59 months old as the oldest. Most children are female (51,8%).

Environmental health based on the appropriate defecation behavior was obtained at 20,9%, the appropriate water sources were obtained at 74,5%, the appropriate waste disposal management was obtained 84,5%, the appropriate liquid disposal management was obtained 98,2%, and the appropriate handwashing behavior was obtained 84,5%. Only defecation behavior shows more inappropriate results (79,1%). In general, the research found that adequate environmental health is greater (90,9%) in prevalence than inadequate environmental health.

The results show that most children have normal nutritional status based on length/height for age. Normal children are higher (80,9%) in prevalence than severely stunted, stunted, and tall children. The second most prevalent is stunted children (13,6%), then severely stunted (3,6%) and tall children (1,8%). The research found that most children are not stunted. (82.7).

TABLE 1: Characteristics of Respondents.

Characteristics	Frequency (n)	Percentage (%)
Mother's Age (years old)		
20-31	58	52,7
32-43	47	42,7
46-53	5	4,5
Children's Age (months old)		
1-36	71	64,5
37-59	39	35,5
Children's Gender		
Male	53	48,2
Female	57	52,8

TABLE 2: Characteristics of Environmental Health Factors.

Characteristics	Frequency (n)	Percentage (%)
Defecation behavior		
Inappropriate	87	79,1
Appropriate	23	20,9
Water source		
Inappropriate	28	25,5
Appropriate	82	74,5
Waste disposal management		
Inappropriate	17	15,5
Appropriate	93	84,5
Liquid disposal management		
Inappropriate	2	1,8
Appropriate	108	98,2
Handwashing behavior		
Inappropriate	17	15,5

TABLE 3: Characteristics of Children's Nutritional Status Based on Length/Height-for-Age.

Characteristics	Frequency (n)	Percentage (%)
<-3	4	3,6
-3 until <-2	15	13,6
-2 until 2	89	80,9
>2	2	1,8

TABLE 4: Correlation between Environmental Health and Stunting.

Environmental Health	Children's Nutritional Status Based on Length/ Height-for-age				P value
	Stunting		Not stunting		
	n	%	n	%	
Adequate	16	84.2	84	92.3	
Inadequate	3	15.8	7	7.7	0.073
Total	19	100.0	91	100.0	

Based on the Spearman Rank Correlation Test for environmental health and children's nutritional status based on length/height-for-age, the results found no correlation (p>0,05) between environmental health and stunting (p=0,073).

DISCUSSION

The results of this research showed that there is no correlation (p>0,0) between a healthy environment and children's anthropometric index length/height-for-age (p=0,073). Descriptively, the cross-tabulation also showed no correlation between environmental health and stunting. The environmental health is mostly adequate both in stunting and non-stunting condition. This might have happened because the data obtained is less varied and the sample is not big enough.

This finding in this research is consistent with research conducted in Kenya and Bangladesh, the research found that there is no effect of water, sanitation, and handwashing groups on the linear growth of children (15,16). While another study that obtained data from Indonesia's Basic Health Research 2013 has shown that proper sanitation and hygiene had a significant impact on stunting among children in Indonesia (17).

Water, sanitation, and hygiene have a very broad category of interventions with different interventions that may be more or less proper in different settings. The same interventions may have different outcomes. The reason for the unexpected result could be myriad. Because historically, wash intervention has shown a significant effect in controlling disease (18). An unhealthy environment can induce infection and inadequate intake of nutrition. Infections such as diarrhea, intestinal worms, and environmental enteropathy (fecal contamination causes changes to the intestines affecting permeability and absorption) can disrupt nutrient absorption and reduce appetite, resulting in nutritional problems, especially stunting.

CONCLUSIONS

Most children have adequate environmental health. Environmental health based on the appropriate defecation behavior was obtained at 20,9%, the appropriate water sources were obtained at 74,5%, the appropriate waste disposal management was obtained at 84,5%, the appropriate liquid disposal management was obtained at 98,2%, and the appropriate handwashing behavior was obtained at 84,5%. Most of the children are normal and not stunted. Environmental health does not correlate (p>0,05) with the stunting of children under five years old in Puskesmas Balowerti, Kediri city (p=0,073). It might have happened because the data is less varied. Further research is needed with a larger sample and more varied data.

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