

## Conference Paper

# Behavioral and Environmental Risk Factors Related to Stunting Incidents in Toddlers

Dini Daningrum\*, Tika Yuliana, Rio Ardiantoru, Maman Sutisna

Public Health Program Study, Health Science Faculty, Faletahan University

## Abstract.

Stunting is a growth disorder or condition of failure to thrive in children due to lack of nutrition and repeated infections in the first 1000 days of life, causing the child to be shorter than his age. This study aims to determine the risk factors associated with stunting in toddlers in Pulo Ampel District in 2021. This study uses an observational study with approach case control. The instruments used are questionnaires and observation sheets. Sample in this study consisted of 72 case and 72 control by using purposive sampling technique. From the results of the univariate test in the stunting toddler group, it was found that the knowledge of mothers was not good (90,3%), low economic status (98,6%), the availability of clean water facilities that did not meet the requirements (8,3%), latrines were not available (13,9%), and poor feeding patterns (76,4%). Statistical test using Chi Square, obtained the results of mother's knowledge ( $P_v = 0,000$ ), economic status ( $P_v = 0,000$ ), availability of clean water facilities ( $P_v = 0,012$ ), availability of latrines ( $P_v=0,003$ ), and feeding patterns ( $P_v = 0,000$ ) has a significant relationship with the incidence of stunting in toddlers. Suggestions from this research are expected for the Puskesmas to provide counseling with video media and booklets about stunting and nutritious eating for toddlers.

**Keywords:** stunting, clean water, toilet, toddlers

## 1. Introduction

Nutritional balance must be maintained since a woman single, then her nutritional intake is maintained until a woman is pregnant and breastfeeding. This period is the first 1000 days of life (window of opportunity) important in the development and growth of toddlers. The growth period at the right age is the foundation for growth and development in the next stage, if during this period the child has nutritional problems, the consequences that arise can be permanent. Provision of nutritional intake to pregnant women and toddlers who are inadequate for a long time can lead to stunting and is exacerbated by the emergence of recurrent infectious diseases such as diarrhea and pneumonia [1].

Corresponding Author: Dini Daningrum; email: dinda.kaisya@gmail.com

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Stunting usually occurs in toddlers and children, symptoms of stunting are seen when children are 24 months old. Stunting is a growth disorder in children diagnosed according to height for age (TB/U) with a value of  $<-2$  SD according to the WHO growth curve. Stunting is caused by chronic nutritional disorders that occur since toddlers are in the mother's fetus [2]. The impacts caused by stunting consist of short-term, medium-term and long-term impacts. The short-term impact is in the form of disrupted child growth and development and delays in the development of children's cognitive abilities. While the medium-term impact can be in the form of a decrease in the level of productivity and quality as adults. And the long-term effects caused by stunting are metabolic disorders, heart disease, stroke and diabetes mellitus [3].

According to UNICEF in 2018 around 3 out of 10 toddlers suffer from stunting, 1 in 10 toddlers are underweight and one fifth of primary school children are obese or overweight. The prevalence of stunting in children under five years of age in 2020 is 22% or 149.2 million children. This case has decreased compared to cases in 2000 which reached 203.6 million. UNICEF said that more than half or 56% of stunted children live in Asia and 37% of them live in Africa [4]. According to WHO data, the prevalence of stunting in the world has fallen from 2015 by 23.2% to 2019 to 21.3%, but there has been an increase in cases of stunting in 2020, namely to 22%. The decrease in stunting cases in 2015-2019 was the impact of the Covid-19 pandemic. The highest stunting cases were found on the continents of Africa and Asia. With the highest cases being on the African continent, namely Central Africa 36.8%, East Africa 32.6% and West Africa 30.9%. Meanwhile, the highest cases of stunting in the Asian continent occurred in South Asia, 30.7% and Southeast Asia, 27.4% [2].

The Asian Development Bank (ADB) reports that in 2020 Indonesia will be the second country in Southeast Asia with the highest stunting prevalence rate in children under five, namely 31.8% [5]. According to data from the Indonesian Nutritional Status Study in 2021 the prevalence rate of stunting in Indonesia is 24.4% [6]. This figure is still high above the WHO parameter which targets a stunting prevalence rate of less than 20% in all countries. WHO through the World Health Assembly (WHA) has a target of reducing the prevalence of stunting in all countries by 40% by 2025, including Indonesia, where until now the problem of malnutrition still requires special attention for government health program [7].

Based on Riskesdas data for 2018, the prevalence of nutritional status (TB/A) in toddlers in Indonesia is in East Nusa Tenggara Province at 42.6%, while in Banten

Province it is 26.6%. This figure is still very high from the target set by WHO [8]. Indonesia through the BKKBN is targeting to reduce the national stunting rate in 2024 in all provinces in Indonesia to below 20%. According to SSGI data in 2021 stunting cases in Banten Province are 23%, with Serang Regency being the area with the highest stunting cases in Banten Province, reaching 38%, followed by Lebak Regency and Pandeglang Regency at 33% [9].

According to the Pulo Ampel Report for 2021, there were 596 (18.1%) babies experiencing stunting, with a short and very short rating of 3,292 toddlers. The highest cases of stunting occurred in Kedungsoka Village with 106 toddlers, this is the basis for the authors to study the incidence of stunting in Pulo Ampel District. The purpose of this study is to determine the risk factors associated with the incidence of stunting in toddlers in Pulo Ampel District in 2021.

The problem of stunting is complex as described by various conceptual frameworks, focusing on child malnutrition, maternal malnutrition, and food and nutrition security. Factors that cause stunting can be seen from a biological, social and environmental (sanitation) perspective. Polluted environment, dense population, poor water and sanitation will affect the growth of children. The environment where toddlers live plays an important role in the growth and development of children, so environmental sanitation that is not hygienic is feared to affect the health and vulnerability of toddlers to infectious and chronic diseases.

## 2. Methods and Equipment

### 2.1. Study design

The research design used was an observational study with a case control approach. The study was conducted in Kedungsoka Village, Pulo Ampel District.

### 2.2. Sample

The case population in this study consisted of 106 children under five and a control population, as well as 428 non-stunted individuals. The comparison of case and control samples was 1:1, where the number of case samples was 72 listed in the results of the puskesmas report and the control sample was 72 respondents. Who live close to

the case. Sampling was carried out using an impressive sampling technique that is intentional and not random/determined by the researcher himself.

### 2.3. Instrument

Collecting data using questionnaires, observation sheets, weights and weights by using interview, observation and measurement methods. Questionnaires and observation sheets were obtained from previous research questionnaires that had been used by previous researchers.

### 2.4. Data collection procedure

Source of data comes from primary and secondary data. Cases of stunting were obtained from secondary data from Pulo Ampel's monthly report for 2021, while knowledge of mothers, economic status, availability of clean water facilities, availability of latrines and patterns of feeding toddlers were obtained from primary data using interview techniques with mothers and families of toddlers. Data analysis is univariable to study the distribution of cases by showing frequency tables for each variable, both the independent variable (stunting) and the dependent variable (mother's knowledge, economic status, availability of clean water facilities, availability of latrines and toddler feeding patterns).

### 2.5. Data analysis

Bivariate analysis through statistical testing using chi square with a rare richness level ( $\alpha$ ) = 5% and 95% confidence level.

## 3. Results

Based on table 1, it can be explained that 90.3% of toddler mothers had less knowledge in the case group and 5.6% of toddler mothers who had less knowledge of the control group. Low economic status in families under five in the case group was 98.6% while in the control group it was 68.1%. The availability of clean water facilities did not meet the requirements in the case group as much as 8.3% and in the control group as much

TABLE 1: Distribution of stunting incidents in toddlers based on behaviour and environmental risk factor.

Variable	Stunting Incidents				Total	
	Case		Control		N	%
	N	%	N	%		
<b>Mother's Knowledge</b>						
Less	65	90,3%	4	5,6%	69	47,9%
Great	7	9,7%	68	94,4%	75	52,1%
<b>Economic Status</b>						
Low	71	98,6%	49	68,1%	120	83,3%
High	1	1,4%	23	31,9%	24	16,7%
<b>Availability of Clean Water Facilities</b>						
Unqualified	6	8,3%	0	0,0%	6	4,2%
Have qualified	66	91,7%	72	100,0%	138	95,8%
<b>Availability of Latrines</b>						
Not have latrines	10	13,9%	0	0,0%	10	6,9%
have latrines	62	86,1%	72	100,0%	134	93,1%
<b>Food-Feeding Patterns</b>						
Poor	55	76,4%	8	11,1%	63	43,7%
Great	17	23,6%	64	88,9%	81	56,3%
<b>Total</b>	<b>72</b>	<b>100,0%</b>	<b>72</b>	<b>100,0%</b>	<b>144</b>	<b>100,0%</b>

as 0%. Families of toddlers who do not have family latrines in the case group are 13.9% while in the control group are 0%. And the pattern of feeding toddlers with poor families in the case group was 76.4% and the control group was 11.1%. From these results it can be seen that all risky variables in the stunting case group have a higher probability than the control group.

TABLE 2: The relationship between behaviour and environmental risk factor with stunting incidents in toddlers.

Variable	Pvalue	OR
Knowledge	0,000	157,857
Economic Status	0,000	33,327
Availability Of Clean Water Facilities	0,012	
Availability Of Latrines	0,003	
Food-Feeding Patterns	0,000	25,882

From the table 2, it can be seen that knowledge (pvalue = 0.000), economic status (pvalue = 0.000), availability of clean water facilities (pvalue = 0.012), availability of latrines (pvalue = 0.003) and toddler feeding patterns (pvalue = 0.000) have significant relationship to the incidence of stunting in toddlers in Pulo Ampel District. Mothers of toddlers who have less knowledge are at risk of 157.9 times higher for their toddlers to

be stunted than mothers of toddlers with good knowledge. The low economic status of families of toddlers has a 33.3 times higher incidence of stunting. And mothers with poor feeding patterns for their toddlers have a 25.9 times higher risk of having their toddlers affected by stunting.

## 4. Discussion

Knowledge is the result of knowing someone after experiencing recognition by their senses [10]. Behavior based on knowledge will stick longer than behavior that is not based on knowledge, so that knowledge is a determining factor for a person's health behavior. Mother's knowledge in this study means the mother's understanding and ability to fulfill nutrition during pregnancy and nutrition in her toddler, so that toddlers avoid infectious diseases and chronic diseases. Mother's knowledge can come from formal education and informal education such as cadre counseling, information from social media [11]. From the results of this study, a significant relationship was obtained between mother's knowledge and the incidence of stunting in toddlers. This research is in line with Asweroz Umbu Zogara's research (2019) which said there was a relationship between mother's knowledge (pvalue = 0.002) about nutrition and the incidence of stunting in toddlers in Kupang City [12]. Sitti Hutami Megantari (2020) also stated that mother's knowledge (pvalue = 0.003) has a significant influence on the incidence of stunting in toddlers in Makassar City [13].

Mother plays an important role in choosing a nutritious food menu for the family. A mother's lack of knowledge about nutrition and stunting can lead to malnutrition in the family, especially toddler food. Mothers with less knowledge will find it difficult to receive information, causing parents (mothers) to pay less attention to food intake that enters their bodies and more importantly, to feed their children and do not know the impact that will occur if the child is stunted and what is the child's character.

Economic status is a condition of income and purchasing power owned by a family in order to fulfill primary, secondary and tertiary needs. Economic status determines the quality and quantity of a family in fulfilling nutrition in a family. Toddlers who live in families with low economic status are vulnerable to disease and are at risk of stunting. Low family income affects adequate family food consumption, so that the nutritional quality of food is no longer the main factor that is fulfilled but it is enough to pay attention to the fulfillment of food [7].

The results of the study showed that there was a significant relationship between economic status and the incidence of stunting in toddlers. This research is in line with the research by Agustin & Rahmawati (2021), in this study a significant relationship was found between family income (pvalue = 0.004) and the incidence of stunting [14]. Hana Ilmi Khoiriyah (2021) also said that the economic status of the family (pvalue = 0.027) is closely related to the incidence of stunting in toddlers in Sukabumi Regency [7].

A family with good nutritional status will also increase family access to food and thus improve. Families with low economic status tend to be at greater risk of stunting because of their inability to meet the nutritional needs of the toddler. Lower family economic status will affect the quality and quantity of the food consumed by the family. Foodstuffs are usually small in number and varied considerably in foods that have a function for a child's growth such as protein, vitamins, and minerals.

The clean water facility is a source of clean water used by the family for bathing, washing, and consumptive needs. Clean water facilities that meet the requirements are water sourced from springs with closed containers and watertight wells. Clean water facilities that meet the requirements can prevent transmission of diarrheal disease, diarrheal disease is an infectious disease that can attack toddlers. Toddlers who get diarrhea can interfere with body growth and are at risk of stunting [15]. The results of this study indicate that there is a significant relationship between the availability of fresh water and the incidence of stunting in toddlers. This research is in line with the research of Adriany et al (2021) which obtained from the results of the chi-square test obtained pvalue = 0.000 so that it can be said that there is a relationship between clean water and the incidence of stunting [16], [15].

Clean water facilities are needed for every family. Water is a basic need for the family to meet their daily needs, so it is expected that every family has clean water facilities that meet the requirements. Clean water that does not meet the requirements risks causing diseases such as diarrhea, typhus, hepatitis, and others. Every family is required to have a supply of clean water equipment that meets health requirements to maintain family health, including to develop optimally.

Ownership of sanitation facilities and access to healthy latrines are factors that influence the transmission of infectious diseases. Families who have a latrine in their house have a greater chance of disposing of feces to meet the requirements. However, a healthy latrine also has conditions, namely the latrine must be closed, use a goose neck and have a septic tank drain, water and soap must be available near the latrine,

the latrine roof must be covered with a watertight latrine floor [17]. The results of this study indicate that there is a significant relationship between latrines and the incidence of stunting in toddlers. The results of this study are the same as Hamun Sasmita's research (2021) which found a close relationship between family latrine ownership and stunting [15], [18].

Having a family latrine is a basic need, but families with a low economy and residents who live on the banks of rivers or forests will choose to defecate in the open. Because making latrines does not only create holes that make the latrines not meet the requirements for healthy latrines. Latrine facilities that do not meet health standards are triggered by hygiene and sanitation diseases such as diarrhea and disabilities which can interfere with nutrition in the digestive process. Some infections carried by toddlers can cause babies to lose weight and if consumed for a long time can cause stunting.

Mothers who do not pay attention to feeding their toddlers are the cause of poor toddler eating patterns. Balanced nutritional intake in toddlers depends on the mother's diet. The average toddler should eat main meals 3 times a day, eat fruit and snacks 2 times a day. Children aged > 24 months usually consume family food to fulfill their nutritional needs. Not only rice and vegetables, children's protein and vitamin needs can also be consumed from meat and fruit [19].

The results of this study indicate that there is a significant relationship between diet and the incidence of stunting in toddlers. This research is in line with previous research which said diet affects the incidence of stunting in toddlers aged 24-59 months [19]. Sitti Hutami Megantari's research concluded that parenting has a strong influence on the incidence of stunting in toddlers aged 24-59 months [13].

Toddlers with poor eating patterns have a high impact on the growth and intelligence of babies because they do not meet the nutritional needs of babies adequately. The diet adopted by the mother of the toddler must also be based on the mother's knowledge. Mothers who get information and knowledge about fulfilling toddler nutrition are expected to be able to meet the nutritional needs of toddlers. Providing a toddler's diet greatly affects the growth and development of toddlers, with balanced and adequate nutrition obtained by toddlers, it is hoped that toddlers will avoid infectious and chronic diseases, especially stunting.



## 5. Conclusion

From the results of research, it was found that the factors that cause stunting in toddlers are mother's knowledge, economic status, availability of clean water equipment, availability of latrines, and feeding patterns. The mother's knowledge factor is the factor that has the highest risk of affecting the incidence of stunting in toddlers, with a 158 times higher risk occurring in mothers with less knowledge.

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## Conflict of Interest

Not there is *conflict of interest*

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