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# IMPLEMENTATION OF WASH (WATER, SANITATION, AND HYGIENE) WITH STUNTING INCIDENTS IN PUJER DISTRICT, BONDOWOSO REGENCY

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**ABSTRACT**

**Implementation of WASH (Water, Sanitation, and Hygiene) with Stunting Incidents in Pujer District, Bondowoso Regency.** The Government of Indonesia is working with the United Nations International Children's Emergency Fund (UNICEF) to support a development program for the Water, Sanitation, and Hygiene (WASH) sector. Globally, access to WASH is still inadequate, and diseases resulting from poor WASH contribute to 13% of under-five deaths. Poor sanitation can cause a variety of diseases, including nutritional problems such as stunting. In 2021, Bondowoso will become one of the 10 regencies or cities with the largest prevalence of stunting under five in East Java. Therefore, it is important to conduct research that aims to examine the link between the success of WASH implementation and the stunting rate in Pujer District, Bondowoso Regency. This quantitative descriptive study was conducted in the Pujer District with a total sample of 67 respondents using a simple random sampling technique. The study used several variables, including the hygiene behavior of mothers under five, the ownership of access to family sanitation, the physical quality of family drinking water, the incidence of infectious diseases (diarrhea) in children, and the nutritional status of children based on height and age (TB/U). The analyses were univariate, crosstab, and scoring. There were 16 families (24.4%) with an unsuccessful WASH assessment but no stunting below five, and 33 families (49.25%) with a successful WASH assessment but no stunting below five. It was concluded that the better the WASH was applied, the better the nutritional status of the toddlers; conversely, the worse the WASH was implemented, the worse the nutritional status of the toddlers.



## INTRODUCTION

Safely managed sanitation is recognized as a top priority in improving community health, nutrition, and productivity, and it is an explicit target of the sixth Sustainable Development Goal's (SDG's) goal (1). One of the sixth SDG targets by 2030 is to achieve access to adequate and equitable sanitation and hygiene for all (2). The Indonesian government is collaborating with the United Nations International Children's Emergency Fund (UNICEF) to support the Drinking Water and Environmental Health sector development program called Water, Sanitation, and Hygiene (WASH). However, there are still 17 million people who practice open defecation (BABS), and less than 10% do not have access to sanitation services. The sentence

"less than 10% do not have access to sanitation services" lacks clarity; it should actually read "more than 90% do not have access to sanitation services." One of the world's pressing problems is the lack of access to clean water, sanitation, and hygiene [3]. Globally, access to WASH is still inadequate, and diseases resulting from poor WASH contribute to 13% of under-five deaths. Poor sanitation can create various kinds of diseases, one of which is nutritional. Stunting is one of the current malnutrition problems.

According to data from the 2021 Indonesian Nutritional Status Study (SSGI), Indonesia is still above 24% in stunting incidence. Recommendations that can be made include strengthening community-based interventions, such as improving water, sanitation, and hygiene (WASH) to protect children from diarrhea and malaria, worms, and causes of subclinical infections [4]. One of the efforts that has been made is that, in collaboration with various partners, UNICEF completed a 3-year multi-sectoral program from 2019 to 2021 to accelerate stunting reduction in Aceh. In line with UNICEF theory (2013) in the Health Research and Development Agency (2015), the causes of stunting are divided into basic causes, direct causes, and indirect causes [6]. Environmental health is one indirect aspect. Environmental sanitation and hygiene have an important role in reducing the incidence of stunting in children. Caregivers of toddlers and toddlers who practice good hygiene, such as washing their hands after defecating and before eating, can reduce the risk of stunting by 15% [7]. Poor sanitation significantly influences the incidence of stunting and increases the risk of stunting by up to 5.0 times compared to toddlers with good home sanitation [8].

In 2021, there will be 27 provinces with stunting cases in the chronic-acute category, one of which is East Java Province, at 23.5% [7]. In East Java, there are 10 regencies or cities with a higher prevalence rate than the Indonesian average prevalence, namely 24.4%. The 2019 Indonesian Nutritional Status Study (SSGI) and the 2021 Indonesian Nutritional Status Study (SSGI) showed that stunted toddlers in Bondowoso Regency were included in the high prevalence, namely >30%. In both 2021 and 2022, several villages in Pujer District will be included in the stunting locus. Data from the weighing month of August 2021 revealed that 371 toddlers, out of 2,421 toddlers (15.32%), experienced stunting. According to data from the Ministry of Health of the Republic of Indonesia, taken from the monev.stbm website, coverage of 5 STBMs in Bondowoso Regency is 77.57%. Pujer is the subdistrict with the lowest access to sanitation in Bondowoso Regency, at 43.1%. It is suspected that there is a high stunting rate and low sanitation. In Pujer District, Bondowoso Regency, there is a connection between sanitation and the incidence of stunting. Conducting a study on the impact of WASH implementation on the incidence of stunting in Pujer District, Bondowoso Regency, is crucial.

## MATERIALS AND RESEARCH METHODS

This study used observational research methods with a descriptive-quantitative approach. This research will aim to examine the relationship between WASH implementation and the incidence of stunting in Pujer District, Bondowoso Regency. The population of this study consisted of toddlers aged 0-59 months, specifically 199 toddlers in Pujer District, Bondowoso Regency. The sampling technique is simple random sampling. This research uses secondary and primary data. We obtained secondary data sources by publishing the results of our analysis of stunting data measurements in Bondowoso Regency, visiting the official monev.stbm website of the Ministry of Health, and consulting the KIA book. Meanwhile, primary data was obtained from measuring the body length and height of toddlers and interviews with mothers of toddlers using a questionnaire. Data analysis was carried out univariately to describe and present the characteristics of each variable; a crosstab was used to see the relationship between WASH and stunting; and scoring was carried out to determine the implementation of WASH for each resource. The determination of children's nutritional status is carried out using the WHO Antro application. In Pujer District, Bondowoso Regency, the data was presented in a descriptive way by showing the results of

WASH implementation and the connection between WASH implementation and stunting incidents in the form of tables with written explanations. The research ethics review was carried out at the Faculty of Dentistry, Jember University, with ethics number 2029/UN25.8/KEPK/DL/2023.

## RESEARCH RESULTS AND DISCUSSION

Hygiene Behavior, Access to Sanitation, and Physical Quality of Drinking Water

Health behavior refers to the actions of individuals, groups, and organizations, including social change, policy development and implementation, improving coping skills, and improving quality of life. The variables used in hygiene behavior are: open defecation, hand washing with soap, waste management, liquid waste management, and drinking water management. Sanitation access is a sanitation facility that meets health requirements; namely, the facility is used by the household alone or together with certain other households and is equipped with a gooseneck-type toilet as well as a final disposal site for feces in the form of a septic tank, or IPAL.

Table 1. Hygiene Behavior, Access to Sanitation, and Physical Quality of Drinking Water

| Variable | Not enough | Good |
|---|---|---|
| **Hygiene behavior** | 43 | 24 |
| **Sanitation Access** | 43 | 24 |
| **Physical Quality of Water Drink** | 0 | 67 |

This research reveals that the majority of mothers in Pujer District, specifically 43 individuals (64.2%), exhibit poor hygiene behaviors. This hygiene behavior includes stopping defecation, washing hands with soap, drinking water management, waste management, and liquid waste management. These hygiene behavior points align with the 5 STBM pillars. The STBM strategy aims to reduce the incidence of diarrheal diseases and environmental-based diseases related to sanitation and behavior by establishing comprehensive sanitation conditions. A person's hygiene behavior is a factor that is closely related to the incidence of diarrhea. In line with research conducted by Nuri and Dewi in 2019, poor maternal hygiene behavior greatly influences the incidence of diarrhea in toddlers. The more a mother practices good hygiene, the more
There is a low incidence of diarrhea in toddlers [10]. The majority of Pujer residents pile up their trash and then burn it to make it more practical. Research conducted by Herawati et al. stated that the habit of throwing children's feces carelessly into rivers and the habit of throwing rubbish inappropriately greatly affects the level of environmental health and can result in children being susceptible to infectious diseases, which will influence the incidence of stunting [11]. Pertiwi et al. also found that a proportion of families who did not throw rubbish in the right place had stunted toddlers of 100%, a proportion of families who did not use healthy latrines had stunted toddlers of 75%, and a proportion of children who did not wash their hands before eating was more stunted than toddlers who are accustomed to washing their hands before eating [12]. This research shows that the least common hygiene behavior is disposing of waste that does not match its type (97%) and disposing of liquid waste in the right channel (54%). This can create a breeding ground for vectors and rodents, as well as pollute the environment around the house, which can cause infectious diarrhea and stunting.
Table 1 shows that the majority of sanitation access in Pujer District is lacking. This is proven by the number of families with access to sanitation in the poor category of 43 people (64.2%). Family sanitation access includes ownership of a latrine, hand washing facilities,

drinking water facilities, SPAL, and household waste bins. Having basic sanitation facilities at home is one of the requirements for a healthy home. Toilets with goosenecks and final waste disposal sites with septic tanks [13] provide access to proper sanitation. The majority of Pujer communities do not have septic tanks or final sewers, so liquid waste is dumped directly into the river. Research conducted by Annita et al. shows that the use of toilet facilities that do not meet health requirements, the practice of open defecation, and the disposal of toddler feces not in toilets cause environmental pollution that can contaminate children, thus facilitating the transmission of pathogens originating from feces and increasing the incidence of stunting in toddlers. [14]. Families who do not have access to clean water are three times more likely to experience stunting than families who do. Not having SPAL is 1.7 times more likely to experience stunting than those who have it, but this risk is not statistically significant with a p value of 0.227 [15]. This research revealed that the Pujer community's lack of a septic tank (100%) and direct discharge of household waste into the nearby river were the primary causes of the lack of family access to sanitation. There are still many people who do not have SPALs, so liquid waste resulting from household activities is channeled into the gutter, sometimes causing odors and puddles of water.

In this study, the physical quality of drinking water is calculated based on scores obtained through observation. The observations were conducted by assessing four points of the physical quality of drinking water: clear, colorless, tasteless, and odorless. The physical quality of drinking water is classified into good and poor categories. Having access to sanitation is said to be good if the score is 3–4 and poor if the score is 0-2. Based on observations of the physical quality of drinking water, all respondents had drinking water that was clear, colorless, tasteless, and odorless. Environmental Health Quality Standards for Water media for sanitation Hygiene purposes include physical, biological, and chemical parameters, which can be mandatory or additional. Apart from hygiene and sanitation purposes, raw water can be used for drinking. The physical parameters of suitable drinking water include being clear, colorless, tasteless, and odorless. The observations and analyses conducted on mothers of toddlers in Pujer District revealed that all samples had clear, colorless, tasteless, and odorless drinking water. The availability of unimproved drinking water comes from unimproved sources, and the distance to the water source is too close Latrines and inappropriate water treatment before consumption can cause nutritional disorders in children [16].

Incidence of Infectious Diseases (Diarrhea)

This research showed that there were 15 toddlers (22.4%) who experienced diarrhea. Diarrhea is caused by various nutritional factors, parental behavior factors, and dirty environmental factors. Open defecation affects the incidence of diarrhea in toddlers. According to Kasman and Nuning's 2020 research, there was a relationship between latrine ownership, latrine condition, and diarrhea incidence in Banjarmasin City [17]. Faeces disposal sites that do not meet hygiene standards increase the risk of bloody diarrhea less than five times when compared to households that do. Diarrhoea is also an infectious disease that can cause stunted growth in toddlers. According to Zulifikar's research, toddlers who have a history of frequent diarrhea are 3.4 times more at risk of stunting than toddlers who have a history of rare diarrhea [18]. An increase in the duration of diarrhea, fever, and ARI is closely related to other nutritional levels, namely a decrease in the BW/U index [19].

## Nutritional Status of Toddlers

According to Presidential Regulation of the Republic of Indonesia Number 72 of 2021 concerning the acceleration of stunting reduction, stunting is a disruption in the growth and development of children due to chronic malnutrition and recurrent infections, which is characterized by their body length or height being below the standards set by the Minister who carries out government affairs in the field of health. Stunting can be caused by a variety of factors, including environmental and infectious diseases.

Table 2. Nutritional Status of Toddlers

| No. | TB/U Nutritional Status | n | % |
|---|---|---|---|
| 1. | Not Stunting | 46 | 68.7 |
| 2. | Stunting | 21 | 31.3 |
| | Total | 67 | 100 |

The research conducted found that 21 (31.3%) toddlers were stunted out of the 67 toddlers who were measured. This can be interpreted as meaning that this figure is still quite high because the stunting reduction target in 2024 is 14%, which has been set by the President in Presidential Regulation Number 72 of 2021 [20]. According to the Ministry of Health of the Republic of Indonesia, stunted toddlers have a Z-score value of less than -2 SD, or standard deviation (stunted), and less than -3 SD (severely stunted). Children who are stunted experience slow and short skeletal growth due to unmet nutritional needs and increased pain over a long period of time. Stunting also causes cognitive development and learning achievement to tend to be slower compared to children of the same age. According to research conducted by Adilla et al. in 2019, stunting and IQ are related to brain development, with stunted children having a lower IQ score than non-stunting children [21].

**We successfully implemented WASH with stunting events.**

According to Presidential Regulation of the Republic of Indonesia Number 72 of 2021 concerning the acceleration of stunting reduction, stunting is a disruption in the growth and development of children due to chronic malnutrition and recurrent infections, which is characterized by their body length or height being below the standards set by the Minister who carries out government affairs in the field of health. WASH success includes drinking water sources, drinking water management, the physical quality of drinking water, latrine ownership, and waste management.

Table 3. Success of WASH Implementation

| No. | Successful Implementation of WASH | n | % |
|---|---|---|---|
| 1. | Succeed | 50 | 74.6 |
| 2. | Not successful | 17 | 24.4 |
| | Total | 67 | 100 |

Result analysis obtained that there is 50 person (74,6%) Which Succed
There were 17 individuals (24.4%) who failed to implement WASH in their household.

Table 4. Implementation of WASH with Stunting

| Nutritional Status (Stunting) / Success WASH | Yes | No |
|---|---|---|
| **Succeed** | 5 | 33 |
| **Not successful** | 16 | 13 |

Several factors influence the success of WASH implementation, including hygiene behavior, family ownership of sanitation access, and the physical quality of drinking water. According to UNICEF, WASH is a form of business that promotes adequate clean water, health, and sanitation. WASH implementation is closely related to various environmental diseases, including infectious disease. Infectious diseases are a direct cause of stunting in toddlers. Collaboration and integration between drinking water, sanitation, and nutrition programs are necessary to reduce slowdowns and achieve the goal of universal access to drinking water and sanitation services. This collaboration requires human resources (HR) who are able to manage STBM and stunting activities evenly throughout Indonesia, as well as collaboration between human resources who are experienced in the field of STBM and human resources who are experienced in the field of stunting [22]. For sustainable development of WASH services, the Indonesian government has set a target of 90% of the population having good sanitation, including 15% of households with safe sanitation. By 2024, 100% of households will have access to safe drinking water, including 15% with safe drinking water and 30% with access to tap water and open defecation (ODF) [23].

The incidence of stunting in Pujer District is still relatively high because the figure exceeds 14% in accordance with the stunting reduction target by 2024. This study reveals that there are 16 families (24.4%) whose WASH success assessment is unsuccessful and have stunted toddlers. 33 families (49.25%) fall into the category of successful WASH implementation, and children under five do not experience stunting. It is clear that the success of WASH implementation is linked to the incidence of stunting in Pujer District. In line with research conducted by Wulandari et al. in 2019, there was a relationship between environmental sanitation, a history of infectious diseases, and the incidence of stunting [24]. Research conducted by Wahyu Divine et al. shows that WASH, which includes drinking water sources, drinking water processing, physical quality of drinking water, latrine ownership, waste processing, and waste management, is related to the incidence of stunting among toddlers in the working area of the Pangkajene City Health Center [25]. The better the WASH implemented, the better the nutritional status of toddlers; conversely, the worse the WASH implemented, the worse the nutritional status of toddlers.

## CONCLUSIONS AND RECOMMENDATIONS

There is a link between the success of WASH implementation and the incidence of stunting in Pujer District. There were 16 families (24.4%) with unsuccessful WASH assessments and stunted toddlers, and 33 families (49.25%) with successful WASH assessments and no stunted toddlers. The better the WASH implemented, the better the nutritional status of toddlers; conversely, the worse the WASH implemented, the worse the nutritional status of toddlers. According to the advice given, it is hoped that the Bapedda of Bondowoso Regency will build sanitation facilities,

particularly a shared septic tank for the Pujer District community. It is hoped that the Bondowoso Health Service will conduct outreach regarding environmental hygiene and sanitation behavior, as well as infectious diseases, which can influence the incidence of stunting in toddlers.

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