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Community-Based Total Sanitation Practices in Families Suffering from Stunting in Raknamo Village, District Amabi Oefeto, Kupang Regency

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Abstract: The stunting rate in Raknamo village is the highest with a total of 45 cases. The research objectives are: Analyzing the relationship between community-based total sanitation (STBM) practices and the incidence of stunting and analyzing the STBM practice factors that are most dominant in their relationship to the incidence of stunting. Therefore, research on STBM practices is very important to find out STBM factors that are related to stunting so that efforts can be made to prevent and overcome stunting. Types of qualitative and quantitative descriptive research (mixed methods). This approach was chosen to understand complex phenomena related to community-based total sanitation (STBM) practices in families of stunting sufferers, identify factors that influence the implementation of STBM, analyze the level of knowledge and community sanitation practices in depth. Qualitative research reveals subjective aspects, people's perceptions of STBM, quantitative research provides an accurate numerical picture of existing conditions. The results show that the defecation habits of respondents in cases with a latrine are 27 (69%), and families who do not have a latrine but still share are 12 (31%). (69%) have a private latrine, but there are still 31% who do not have a latrine and use shared facilities or defecate in the garden. The CTPS practice of families of toddlers with stunting is still low, only 33% always do it, while 64% sometimes do it. All families of toddlers with stunting (100%) boil water before consuming it, but only 79% keep the water source clean.

Keywords: Clean water; Hand washing; Sanitation; Stunting

Introduction

Community-Based Total Sanitation (STBM) is an approach that aims to improve sanitation conditions and community health through active participation of the community in improving sanitation and clean and healthy living behavior (Arsyaf et al., 2023). Stunting is a condition of impaired growth and development in children due to chronic malnutrition over a prolonged period, characterized by a height-for-age measurement that falls below the standard (Hariani et al., 2023; Rahfiludin et al., 2023). Stunting not only affects children's physical growth but also contributes to increased risks of illness, mortality, cognitive impairment, and reduced productivity in adulthood (Oktofani et al., 2025; Prendergast & Humphrey, 2014). Therefore, stunting is considered a strategic public health issue that requires a multidimensional approach to improve the quality of human resources in the future (Kristianingrum et al., 2023).

While stunting has often been associated with inadequate nutritional intake, increasing scientific evidence shows that environmental factors—particularly poor sanitation—play a significant role in its occurrence.

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Unsanitary living conditions can increase children's exposure to infectious diseases such as diarrhea and intestinal worms, which in turn interfere with nutrient absorption and physical growth (Makripuddin et al., 2021). One important community-based approach that addresses sanitation and hygiene behaviors is Community-Based Total Sanitation (*Sanitasi Total Berbasis Masyarakat* or STBM), which includes five key pillars. Proper implementation of STBM is believed to reduce the risk of infections and contribute significantly to stunting prevention.

According to the Indonesian Nutrition Status Survey (SSGI) in 2022, the national prevalence of stunting among children under five remained high at 21.6%. East Nusa Tenggara Province had the highest prevalence in the country in 2021 at 37.8%, and although the rate declined to 22% in 2022, it remained above the national average. In Kupang Regency, the prevalence reached 24.1% or approximately 7,207 stunted children. Specifically, Raknamo Village in the Amabi Oefeto sub-district reported 45 stunting cases, making it the second-highest among villages in the area.

This study is important because most previous research has focused on nutritional or socioeconomic factors, without exploring the specific role of household sanitation behaviors through the STBM approach in relation to stunting. In fact, STBM promotes behavior change at the community level, targeting environmental health practices that directly affect child health outcomes. Furthermore, few studies have comprehensively evaluated the implementation of all five STBM pillars in high-stunting areas such as Raknamo Village. The novelty of this research lies in its comprehensive analysis of the relationship between household-level STBM practices and stunting, as well as in identifying which STBM pillar has the most dominant influence. By focusing on a high-risk, context-specific area, this research is expected to provide evidence-based recommendations for more effective, behavior-oriented stunting prevention strategies.

This study uses an observational analytic method with a quantitative approach and a cross-sectional study design. Data collection was conducted through a survey of families with stunted children to assess their STBM practices at the household level.

Method

This research uses a descriptive research design with mixed methods, namely a combination of qualitative and quantitative approaches (Sugiyono, 2016). This approach was chosen because it was considered capable of providing a complete and in-depth picture of a complex social phenomenon, namely the practice of Community-Based Total Sanitation (STBM) in families of stunting sufferers. The main objective is to explore in depth the community's perceptions and experiences regarding STBM practices. Identify supporting and inhibiting factors in the implementation of STBM and measure the level of community sanitation knowledge and practices numerically and measurably. The following is a complete explanation of the research methods used, equipped with detailed descriptions and flow diagrams to facilitate understanding as shown in Figure 1.

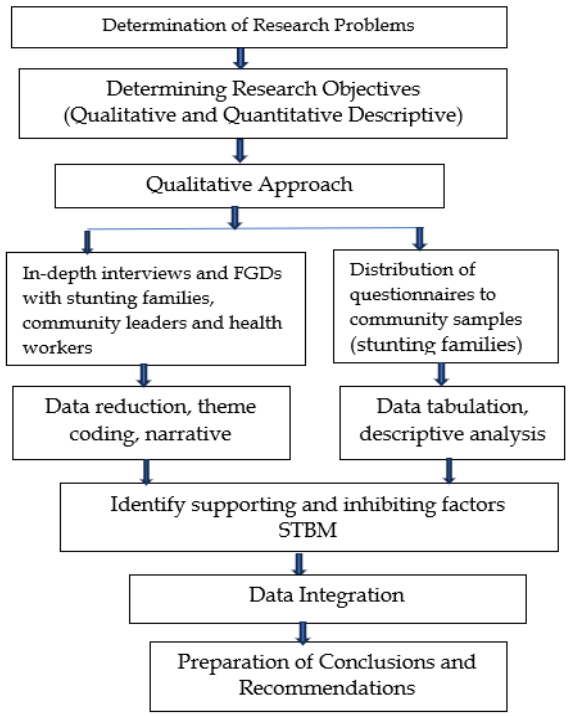

Figure 1. Research schema

Result and Discussion

Results

This research focuses on analyzing the implementation of the five pillars of STBM in families of stunting sufferers. The five pillars include: stop open defecation; wash your hands with soap; management of household drinking water and food; management of household waste; and management of household liquid waste. A complete description of STBM practices in families of stunting sufferers in the research area is presented in the Tables 1.

Table 1 shows that the defecation habits of respondents who have a latrine are 27 (69%), and families who do not have a latrine but still share are 12 (31%). Meanwhile, 2 (5%) of the respondents who do not have a latrine but still share are 37 (95%).

Table 1. Defecation Habits of Families of Toddlers Suffering from Stunting in Raknamo Village

Variable	Case	Percentage (%)	Control	Percentage (%)
Toilet facilities				
Has a toilet	27	69	2	5
Does not have a toilet	12	31	37	95
Total	39	100	39	100
Defecation habit				
In toilet	27	69	2	5
In the toilet/sharing/in the garden	12	31	37	95
Total	39	100	39	

Table 2. Practice of Hand Washing with Soap (CTPS) of Families of Toddlers Suffering from Stunting in Raknamo Village

CTPS Practice	Case	Percentage (%)	Control	Percentage (%)
Always CTPS	13	33	29	5
Sometimes	25	64	8	95
Never CTPS	1	3	2	5
Total	39	100	39	100

Table 3. Drinking and Clean Water Management Practices for Families of Toddlers Suffering from Stunting in Raknamo Village

Variable	Case	Percentage (%)	Control	Percentage (%)
clean water source				
Dug wells	24	62	38	97
Rivers	0	0	0	0
Tap water/piping	0	0	0	0
Others (Tank/pick up at cakdam)	15	38	1	3
Total	39	100	39	100
Practice of managing drinking water by boiling				
Always	39	100	38	97
Sometimes	0	0	1	3
Never	0	0	0	0
Total	39	100	39	100
Maintain cleanliness of water sources				
Yes	31	79	36	92
Never	8	21	3	2
Total	39	100	39	100
Water quality inspection				
Yes	0	0	0	0
Nevwr	39	100	39	100
Total	39	100	39	100

Table 4. Household Waste Management Practices for Families of Toddlers Suffering from Stunting in Raknamo Village

Variable	Case	Percentage (%)	control	Percentage (%)
Trash facilities				
There is	1	3	14	36
There isn't any	38	97	25	64
Total	39	100	39	100
Waste management habits				
Throw it in the trash	1	3	14	36
Burned	38	97	25	64
Throw it away in the garden/stream/river	0	0	0	0
Total	39	100	39	100

Table 2 it shows that the practice of washing hands with soap is 13 (33%) of the respondents always have CTPS, sometimes 25 (64%) have CTPS and 1 (3%) of those who never have CTPS. Meanwhile, control respondents always had CTPS as many as 29 (74%),

sometimes CTPS as many as 8 (21%) and never CTPS 2 (5%).

Table 3, it shows that the practice habits of treating drinking water by always cooking it are 39 (100%) case respondents, sometimes 0 (0%) and never 0 (0%). Table 4, it shows that only 1 (3%) family has rubbish bin facilities and 97% do not have rubbish bin facilities. Meanwhile, only 1 (3%) of the household waste management habits of case respondents threw rubbish in the bin, 38 (97%) managed rubbish by burning it.

Table 5. Household Liquid Waste Management Practices for Families of Toddlers Suffering from Stunting in Raknamo Village

Habits of managing liquid waste	Case	Percentage (%)	Control	Percentage (%)
Dump in open ditch	6	15	10	36
Throw it away in the yard	31	80	26	64
Dispose of in a closed drain	2	5	3	0
Total	39	100	39	100

Table 5 shows the liquid waste management practice habits of case respondents: 31 (80%) of the case respondents disposed of it in the yard, 6 (15%) disposed of it in open ditches and 2 (5%) disposed of it in closed ditches. Meanwhile, 26 (64%) of the control respondents dumped in the yard, 10 (36%) dumped in open ditches and 0% threw away in closed ditches.

Discussion

The research results show that the habit of open defecation (BABS) is still a significant challenge in Raknamo Village, especially for families of toddlers suffering from stunting. Based on the data, most of the case respondents had toilets, 27 families (69%). However, there are still 12 families (31%) who do not have their own latrine and use the facilities by sharing. On the other hand, in the control group, only 2 families (5%) have their own latrine, while the majority, namely 37 families (95%), do not have their own latrine and still share facilities. This shows that the availability of toilets in the control group is lower than in the case group. The availability of adequate sanitation facilities, such as toilets and latrines, is often seen as a key indicator of improved sanitation practices in a community (Gambrill et al., 2020).

This phenomenon can be analyzed from various points of view. First, the availability of adequate toilets in the case group (69%) indicates that there is a certain effort or awareness regarding better sanitation in families with toddlers suffering from stunting. However, this awareness may not be fully effective because the presence of latrines alone is not enough to ensure clean and healthy sanitation practices (Andersson et al., 2016).

Second, the high number of families sharing toilets in the control group (95%) could be an indicator of limited access to basic sanitation facilities. This limitation has the potential to increase the risk of transmission of environmentally based diseases such as diarrheal disease, which is a major public health problem and the main cause of illness and death in children under five in low and middle income countries (World Health Organization, 2018), which in turn can affect children's health and nutritional status. In tropical regions such as northeastern Brazil, diarrhea is the main cause of child mortality, with attack rates exceeding seven episodes per child per year in the first year of life, especially among the poorest families (Sesay et al., 2022). The practice of sharing latrines, although better than open defecation in the open, still carries health risks because it is often not accompanied by adequate latrine hygiene management. This situation can worsen the quality of environmental sanitation around settlements and contribute to high stunting rates Foggitt et al. (2019) in these areas and in many developing areas still poses a significant health risk due to inadequate sanitation management (Antwi-Agyei et al., 2020).

These results also show that families of toddlers with stunting tend to have more latrine facilities than the control group. This may be caused by intervention or more attention from outside parties (such as government programs or health institutions) towards families with stunted toddlers. However, the effectiveness of this intervention needs to be further evaluated to ensure that not only the presence of latrines is addressed, but also changes in behavior that are more hygienic and healthy. In the future, more intensive programs are needed to improve access and quality of sanitation facilities, especially in the control group. In addition, education regarding the importance of cleanliness and correct use of latrines needs to be emphasized to ensure that healthy sanitation practices can be implemented sustainably at all levels of society.

The research results showed that only 13 (33%) of the 39 respondents in the case group consistently washed their hands with soap. This figure is quite low and indicates inadequate habits to protect oneself from exposure to pathogenic germs. The consistency of CTPS is very important in preventing infections such as diarrhea, which is known to cause impaired nutrient absorption and contribute to stunting. Most of the case respondents, 64% (25 people), only occasionally wash their hands with

soap. This habit shows non-compliance with hygienic behavior which can increase the risk of environmental-based disease transmission.

This condition increases the possibility of children experiencing recurrent infections, such as gastrointestinal infections, which can have a negative impact on the child's nutritional status and growth. Meanwhile for those who do not wash their hands with soap, although the percentage is small, 3% (1 respondent), the behavior of never using CTPS is the highest risk for exposure to germs and pathogens. This can worsen health risks and increase the likelihood of stunting. Maintaining proper hand hygiene is an important component of personal and public health. Failure to consistently practice hand washing with soap and water, or approved hand sanitizers, pose a significant risk of exposure to harmful bacteria and pathogens (Khairiyah & Fayasari, 2020).

This can have adverse impacts, including increasing the likelihood of contracting infectious diseases and exacerbating the risk of stunting, a condition characterized by impaired growth and development in children (Freeman et al., 2014). Numerous studies have highlighted the importance of hand hygiene in preventing the transmission of infectious diseases. Hand washing has been recognized as a low-cost and effective technique for reducing the spread of microorganisms and lowering the incidence of disease. This is the same as research conducted Gitau et al. (2015) shows a clear relationship between proper hand sanitation and improved infection control in various settings, such as schools, hospitals, and extended care facilities.

Consistent CTPS habits (always carried out) were found more frequently in the control group than in the case group, which shows a positive relationship between hygienic behavior and stunting prevention. Education and sanitation interventions that focus on improving CTPS habits can be a strategic step in reducing the prevalence of stunting. Stunting, which is characterized by impaired growth and development, is still a significant public health challenge, especially in areas with limited resources (Habib et al., 2019). Therefore, interventions that focus on increasing hand washing practices can provide a strategic role in overcoming the problem of stunting (Growth, 2014).

The results of the study showed that there were differences in the use of clean water sources between the case and control groups which were related to the incidence of stunting. As many as 62% of case respondents used water from dug wells, while in the control group the number was higher, namely 97%. In contrast, the use of water from tanks or check dams was more dominant in the case group (38%) compared to the control group (3%). This indicates that the water source used plays a role in supporting or inhibiting stunting (Oginawati et al., 2023; Tetania et al., 2023). Dug wells that meet technical standards, such as being protected from microbiological contamination and a safe distance from sources of pollution, tend to provide better water quality. In the control group, the high use of safe dug wells contributed to the low incidence of stunting. On the other hand, the use of water from tanks or check dams, which are more susceptible to contamination due to unhygienic distribution and storage, is one of the contributing factors to the high stunting rate in the case group. Inadequate access to safe drinking water and poor sanitation practices are contributors significant impact on the high rate of stunting, a form of malnutrition characterized by impaired growth and development in children. Unclean water sources, for example from tanks or dams, are very vulnerable to contamination due to unhygienic distribution and storage practices (Moropeng et al., 2021). Globally, billions of people lack access to basic sanitation services, exposing them to dangerous pathogens in their drinking water and food.

Other influencing factors are water treatment practices and community hygiene behavior. Water from tanks or check dams that are not properly treated has the potential to carry disease-causing pathogens, such as diarrhea, which can directly cause problems with nutritional absorption in children (Marzuki, 2024). Apart from that, low access to safe, clean water infrastructure and bad habits in maintaining environmental cleanliness are also challenges that need to be overcome. As a preventive measure, efforts need to be made to improve the quality and access to clean water, such as improving the construction of dug wells and providing a better water distribution system. Public education about the importance of treating drinking water and maintaining environmental sanitation is also very necessary to support stunting prevention (Prasetya, 2022). This effort must actively involve the community to create sustainable behavior change.

The research results showed that all respondents in the case group (100%) always boiled drinking water before using it, while in the control group, 97% of respondents did the same, while the other 3% sometimes boiled drinking water. Although the majority of respondents in both groups had boiled drinking water, small differences in water treatment practices could contribute to the quality of the water consumed and ultimately influence the incidence of stunting (Cooper et al., 2019).

Boiling drinking water is an important step in water treatment to kill pathogenic microorganisms, such as Escherichia coli bacteria, viruses and parasites, which can cause water-based diseases such as diarrhea (Bivins et al.,

2020; Ogwu et al., 2024; Thani, 2023). This disease is one of the main factors that affects children's nutritional status because diarrhea interferes with the absorption of nutrients in the body. Diarrhea is a significant public health problem, especially in developing countries, because it can interfere with the body's ability to absorb essential nutrients. This is especially a problem for young children, whose growth and development is slow quickly requires adequate nutrition (Hughes & Koplan, 2005). Chronic diarrhea and malnutrition have been linked to a variety of negative health impacts, including stunted growth, cognitive deficits, and reduced economic potential in later life (Ali, 2021; Puhi et al., 2023).

Conclusion

In the case group, even though all respondents boiled water, there may be other factors, such as contaminated water sources or unhygienic water storage methods, which could increase the risk of stunting. Good drinking water management practices, including always boiling water, are important preventive measures against diseases that can trigger stunting. However, the results of this research also show the need to pay attention to other aspects in the water management chain, such as water source quality and storage behavior. Holistic interventions, involving increasing access to safe water sources, education about hygiene, and providing adequate sanitation facilities, are needed to significantly reduce the prevalence of stunting. Although boiling drinking water has become a common practice in the village, further education is needed regarding water management which includes hygienic water storage and monitoring water sources. In addition, a comprehensive approach is needed to increase public understanding of the relationship between good water management, environmental sanitation and stunting prevention, so that existing practices can continue to be improved to support children's health.

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The role of this research is that the corresponding author A.B.T plays the role of designing and compiling, the second author L.Br.T. and E.R.S is data processing and data analysis and the third author Y is data processing and data analysis.

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There is no conflict of interest, this research is solely to improve public health.

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