

THE RELATIONSHIP BETWEEN HANDWASHING WITH SOAP BEHAVIOR AND THE INCIDENCE OF DIARRHEA AMONG TODDLERS

Syeifa Renanda Surya*, Dwi Yulia Maritasari, Rayi Iqbal Faturrahman, Febria Listina

Public Health Study Program, Faculty of Health, Universitas Mitra Indonesia

syiefarenandasurya@umitra.ac.id

ABSTRACT

Diarrhea is a disease that poses a serious risk to children's nutritional status and survival. One of the preventive efforts is handwashing with soap (HWWS). Data from Merbau Mataram Community Health Center show an increasing trend in diarrhea cases among toddlers, from 9.94% (2021) to 56.0% (2024). This study aimed to determine the relationship between handwashing with soap behavior (knowledge, attitude, and practice) and the incidence of diarrhea among toddlers. This was a quantitative study using a cross-sectional approach. The sample consisted of 97 toddlers aged 12–59 months selected using proportional random sampling. The research instrument was a questionnaire, and data were collected through interviews with the mothers of toddlers. Data analysis was conducted using univariate and bivariate analyses with the Chi-square test. The results showed that 43 toddlers (44.3%) experienced diarrhea, while 54 toddlers (55.7%) did not. Most mothers had good knowledge (55.7%), negative attitudes were still relatively dominant (50.5%), and 58.8% of mothers had good handwashing practices. Bivariate analysis showed significant relationships between knowledge ($p=0.002$), attitude ($p=0.018$), and practice ($p=0.000$) with the incidence of diarrhea.

Keywords: behavior; diarrhea; handwashing with soap; toddlers

INTRODUCTION

Handwashing with soap (HWWS) is an important sanitation practice to break the chain of germ transmission, considering that hands often serve as a medium for pathogens causing infectious diseases, including diarrhea. Diarrhea is defined as an increase in bowel movements more than three times per day with liquid consistency, which can be caused by infection, contaminated food, low immunity, and poor hygiene behavior. HWWS has been proven to reduce the incidence of diarrhea by up to 45% and is one of the main pillars of Clean and Healthy Living Behavior (PHBS) and Community-Based Total Sanitation (STBM). However, the habit of handwashing with soap is still often neglected in both developing and developed countries.

Globally, diarrhea remains a leading cause of child mortality, with 1.7 billion cases each year and more than 400,000 deaths among children under five years old. In Indonesia, the prevalence of diarrhea among toddlers continues to increase, including in Lampung Province and in the working area of Merbau Mataram Community Health Center. Based on the high incidence of diarrhea among toddlers and the important role of HWWS behavior, this study was conducted to analyze the relationship between handwashing with soap behavior and the incidence of diarrhea among toddlers at Merbau Mataram Community Health Center, South Lampung, in 2025.

METHOD

This study was a quantitative study with a cross-sectional approach. The study population included all toddlers in the working area of Merbau Mataram Community Health Center, South Lampung, totaling 2,964 toddlers. The sample consisted of 97 toddlers aged 12–59 months selected using proportional random sampling. The independent variables were handwashing with soap behavior, including knowledge, attitude, and practice. The dependent variable was the incidence of diarrhea among toddlers. The research instrument was a questionnaire consisting of 5 knowledge questions,

10 attitude items, 6 practice items, and 1 question regarding diarrhea incidence. Data analysis was conducted using univariate analysis to determine frequency distribution and bivariate analysis using the Chi-square test with a significance level of $p < 0.05$. Odds Ratio (OR) was used to determine the magnitude of risk between variables. Data were collected through interviews with mothers of toddlers. This study received ethical approval from the Research Ethics Committee of Universitas Mitra Indonesia and was conducted in accordance with research ethical principles.

RESULT AND DISCUSSION

Table 1.
Respondent Characteristics

Features respond	They	Category	f	%
Age		Productive (20-35)	51	52,5
		Unproductive (<20 and > 35)	48	47,5
Education		D3	10	10,3
		S1	6	6,2
		SD	12	12,4
		SMA	37	38,1
		SMP	32	33,0
Jobs		Labor	19	19,6
		IRT	32	33,0
		PNS	6	6,2
		Private	15	15,5
		Self-employed	25	25,8

Most of the children under five have mothers of productive age (52.2%), who support readiness to receive health information and the implementation of CTPS, although almost half are at a potentially unproductive age. The majority of mothers are highly educated (high school 38.1% and junior high school 33.0%), which is quite supportive of understanding of CTPS, while low education (12.4%) is at risk of having limited knowledge. Based on occupation, the majority of mothers are IRT (33.0%), followed by the self-employed (25.8%) and laborers (19.6%); IRT tends to spend more time getting used to CTPS in children, while mothers who work outside the home face limitations in the application of CTPS in toddlers.

Table 2.
Distribution of Frequency of Diarrhea Incidence

Incidence of Diarrhea	f	%
Diarrhea	43	44,3
No Diarrhea	54	55,7

Based on the table above of 97 toddlers, most mothers who have toddlers do not experience diarrhea totaling 54 people (55.7%). Meanwhile, some mothers who have toddlers experience diarrhea as many as 43 people (44.3%). These findings show that diarrhea is still a fairly high health problem, this condition can be influenced by maternal behavior in maintaining hygiene, especially the practice of washing hands with soap (CTPS).

Table 3.
Distribution of Knowledge Frequency

Knowledge	f	%
Not Good	43	44,3
Good	54	55,7

Based on above of the who have mothers have good knowledge amounting to 54 respondents (55.7%). Meanwhile, 43 people (44.3%) were poorly informed. These results show that the

majority of mothers already have good knowledge about the importance of CTPS in preventing diseases, including diarrhea in toddlers. However, there are still quite a lot of people who are not well informed, so that it is an inhibiting factor in the consistent implementation of CTPS and affects the incidence of diarrhea.

Table 4.
Distribution of Attitude Frequency

Attitude	F	%
Negatives	49	50,5
Positive	48	49,5

Based on above of the who have mothers have a negative attitude totaling 49 people (50.5%). Meanwhile, some of them had a positive attitude as many as 48 people (49.5%). This shows that although some mothers have good knowledge, not all of them are reflected in a positive attitude. A more dominant negative attitude can be an obstacle to the habituation of CTPS practice, and has the potential to increase the risk of diarrhea in toddlers.

Table 5.
Distribution of CTPS Action Frequency

Actions	F	%
Not Good	40	41,2
Good	57	58,8

Based on above of the toddlers good CTPS totaling 57 people (58.8%). Meanwhile, 40 people (41.2%) of toddlers who had mothers with poor CTPS actions. These results show that the majority of mothers have tried to implement CTPS, but there are still more than a third of respondents who have not implemented CTPS optimally. The lack of CTPS action can open up opportunities for the transmission of germs/viruses that cause diarrhea in toddlers, so even though the mother's knowledge and attitude may be quite good, the application of less consistent measures still risks increasing the incidence of diarrhea.

Table 6.
The Relationship between Knowledge and the Incidence of Diarrhea

Knowledge	Incidence of Diarrhea				Total	P-Value	OR 95% CI	
	Diarrhea		No Diarrhea					
	f	%	f	%	f			%
Not Good	27	62,8	16	37,2	43	100,0	0,002	4,008 (1,712 – 9,383)
Good	16	29,6	38	70,4	54	100,0		

Based on the table above, of the 43 toddlers whose mothers had poor knowledge, 27 toddlers (62.8%) experienced diarrhea. Meanwhile, of the 54 toddlers whose mothers were well-informed, 38 toddlers (70.4%) did not experience diarrhea. The results of the statistical test show value $p = 0.002$ (< 0.05), so that there is between knowledge ibu and incidence diarrhea toddler. Nilai OR = 4,008 iaffirm that toddler with mother knowledge able less good have a risk four times am bigger experience diarea compared to with toddler yang His mother was knowledgeable.

Table 7.
The Relationship between Attitude and the Incidence of Diarrhea

The Relationship Between Attitude and the Incidence of Diarrhea								
Attitude	Incidence of Diarrhea				Total	P-Value	OR 95% CI	
	Diarrhea		No Diarrhea					
	f	%	f	%				f
Negatives	28	57,1	21	42,9	49	100,0	0,018	2,933 (1,276 – 6,742)
Positive	15	31,2	33	68,8	48	100,0		

Based on the table above, of the 49 toddlers whose mothers had a negative attitude, 28 toddlers (57.1%) experienced diarrhea. Conversely, of the 48 toddlers whose mothers had a positive

attitude, 33 toddlers (68.8%) did not experience diarrhea. Statistical test results show a p-value of 0.018 (<0.05), indicating a significant association between maternal attitudes and the incidence of diarrhea in toddlers. An OR of 2.933 indicates that toddlers whose mothers had negative attitudes were 2.9 times more likely to experience diarrhea compared to toddlers whose mothers had positive attitudes.

Table 8.

The Relationship between Action and the Incidence of Diarrhea								
CTPS Actions	Incidence of Diarrhea				Total		P-Value	OR 95% CI
	Diarrhea		No Diarrhea					
	f	%	f	%	f	%		
Not Good	31	77,5	9	22,5	40	100,0	0,000	12,917
Good	12	21,1	45	78,9	57	100,0		(4,858 – 34,343)

Based on the table above, of the 40 toddlers whose mothers had poor CTPS practices, 31 toddlers (77.5%) experienced diarrhea. Meanwhile, of the 57 toddlers whose mothers had good CTPS practices, 45 toddlers (78.9%) did not experience diarrhea. The results of the statistical test showed that $p = 0.000$ ($p < 0.05$), indicating a significant association between mothers' CTPS practices and the incidence of diarrhea in toddlers. The OR value of 12.917 indicates that toddlers whose mothers had poor CTPS practices were 12.9 times more likely to experience diarrhea compared to toddlers whose mothers had good CTPS practices.

DISCUSSION

The Relationship between Knowledge and the Incidence of Diarrhea

The results of this study indicate a significant association between mothers' knowledge and the incidence of diarrhea among toddlers at the Merbau Community Health Center in Mataram, South Lampung, in 2025. Toddlers whose mothers have poor knowledge are at higher risk of developing diarrhea compared to toddlers whose mothers have good knowledge. Knowledge is the result of sensory processes, particularly through sight and hearing; therefore, the higher a person's level of knowledge, the better their health-related behaviors (Notoatmodjo, 2014; Martina, 2021). This is important because toddlers still depend on their mothers to maintain personal hygiene and ensure the cleanliness of their food and drinks. A mother's good knowledge influences hygienic behaviors, including handwashing with soap (HWS) as a preventive measure against diarrhea. These findings align with the research by Gusri et al. (2024) in Padang City, which demonstrated a significant association between mothers' knowledge of HWS and the incidence of diarrhea among toddlers. Similar results were also reported by Hendriani & Ernawati (2023) in Tanggulun, who found that mothers with good knowledge about diarrhea were more likely to have toddlers who did not experience diarrhea. Thus, it can be concluded that increasing mothers' knowledge—particularly regarding personal hygiene and handwashing with soap—plays a crucial role in preventing diarrhea in toddlers. Continuous health education efforts are needed so that mothers can adopt daily hygienic behaviors, thereby reducing the risk of diarrhea in toddlers.

The Relationship between Attitude and the Incidence of Diarrhea

This study shows that there is a significant relationship between mothers' attitudes and the incidence of diarrhea among toddlers at the Merbau Mataram Community Health Center in South Lampung in 2025. Toddlers whose mothers have negative attitudes are at greater risk of experiencing diarrhea compared to toddlers whose mothers have positive attitudes. Attitude is an internal response to a stimulus that is not always immediately apparent but can be reflected in behavior (Notoatmodjo, 2014; Martina, 2021). A positive attitude toward hygienic practices, such

as handwashing with soap (CTPS), will encourage concrete actions in daily life. Conversely, a negative attitude has the potential to increase the risk of toddlers developing diarrhea. These findings are consistent with the study by Purnama et al. (2024) at Dr. Fauziah Bireuen Regional General Hospital, which found a significant association between mothers' attitudes and the incidence of diarrhea in infants. Similarly, a study by Widhiastiti (2023) in Bungaya Village showed that mothers with positive attitudes toward diarrhea prevention tended to have toddlers who did not experience diarrhea compared to mothers with negative attitudes. Thus, the results of this study confirm that mothers' attitudes play a very important role in the prevention of diarrhea in toddlers. Mothers with positive attitudes toward hygiene and health—particularly regarding handwashing with soap and maintaining the hygiene of food and beverages—are better able to protect their toddlers from the risk of diarrhea compared to mothers with negative attitudes.

The Relationship between CTPS Actions and the Incidence of Diarrhea

The results of the study indicate that there is a significant association between CTPS practices and the incidence of diarrhea among toddlers at the Merbau Mataram Community Health Center in South Lampung in 2025. The analysis also revealed that toddlers whose mothers exhibited poor CTPS practices were at higher risk of experiencing diarrhea compared to toddlers whose mothers exhibited good CTPS practices. According to Bloom (as cited in Notoatmodjo, 2014), behavior is classified into three main domains: cognitive (related to knowledge), affective (related to attitudes), and psychomotor (related to actions). These three components are interrelated and shape an individual's behavior in carrying out health-related actions. This study aligns with the findings of Setyobudi (2020) at Mardi Rahayu Hospital in Kudus, which demonstrated a significant association between mothers' handwashing behavior with soap and the incidence of diarrhea in toddlers, where mothers with good handwashing practices were more likely to have toddlers who did not experience diarrhea. These results are supported by Radhika's (2020) study in Sidotopo, which also found that the habit of washing hands with soap correctly and regularly plays a role in reducing the risk of diarrhea in toddlers. Thus, this study demonstrates that proper handwashing practices by mothers are a key factor in reducing the risk of diarrhea in toddlers. These findings underscore that health behaviors are not only influenced by knowledge and attitudes but are also manifested through concrete actions in daily life. By increasing the prevalence of proper handwashing practices, the incidence of diarrhea in toddlers can be minimized, and children's health can be better protected.

CONCLUSION

This study concludes that there is a significant relationship between knowledge, attitude, and handwashing with soap practices and the incidence of diarrhea among toddlers at Merbau Mataram Community Health Center, South Lampung, in 2025. Improving knowledge, fostering positive attitudes, and maintaining consistent handwashing practices among mothers play a crucial role in reducing the risk of diarrhea among toddlers. Therefore, continuous education and health promotion efforts are needed to improve mothers' handwashing behavior.

REFERENCES

- South Lampung Health Office. (2023). South Lampung District Health Profile 2023.
Lampung Provincial Health Office. (2023). Lampung Health Profile 2023.
Ernida, E., Navianti, D., & Damanik, H. (2021). Knowledge, Attitude, and Handwashing with Soap Behavior among Elementary School Students. *Jurnal Sanitasi Lingkungan*, 1(1), 1–7.

- Fadilah, M. A., Damanik, H. D. L., & Yulianto, Y. (2022). Diarrhea Incidence among Toddlers Based on Handwashing with Soap Behavior and Drinking Water Facilities. *Jurnal Sanitasi Lingkungan*, 2(1), 60–65.
- Fadilah, N. (2022). The Relationship between Handwashing with Soap Habits and Basic Sanitation with Diarrhea Incidence among Toddlers. Universitas Aufa Royhan.
- Gusri, M. M., et al. (2024). The Relationship between Maternal Knowledge of Handwashing with Soap and Diarrhea Incidence among Toddlers. *Jurnal Sehat Mandiri*, 19(2), 218–227.
- Hendriani, D. P., & Ernawati, E. (2023). Maternal Knowledge Level about Diarrhea and Diarrhea Incidence among Toddlers. *Jurnal Kesehatan Tambusai*, 4(4), 6511–6515.
- Irwan. (2017). *Epidemiology of Infectious Diseases*. CV. Absolute Media.
- Ministry of Health of the Republic of Indonesia. (2023). *Indonesia Health Profile 2023*.
- Martina. (2021). *Health Promotion and Health Behavior*. Yayasan Kita Menulis.
- Regulation of the Minister of Health No. 3. (2014). *Community-Based Total Sanitation*.
- Purnamawati, T. (2024). Complementary Therapy of Honey Administration in Reducing the Frequency of Diarrhea in Toddlers. Rizmedia Pustaka Indonesia.
- Radhika, A. (2020). The Relationship between Handwashing with Soap Practices and Diarrhea Incidence among Toddlers.
- Setyobudi, I., et al. (2020). Analysis of Maternal Handwashing Behavior and Diarrhea Incidence among Toddlers.
- Wahyuni, F. A., et al. (2024). The Relationship between Handwashing with Soap Behavior and Diarrhea Incidence among Toddlers.
- WHO. (2024). *Diarrhoeal Disease*. World Health Organization.
- Widhiastiti, I. A. M. U., et al. (2023). The Relationship between Knowledge, Attitude, and Practice of Housewives and Diarrhea Incidence among Toddlers.