

THE RELATIONSHIP BETWEEN CLEAN WATER SOURCES AND PERSONAL HYGIENE WITH THE INCIDENCE OF DIARRHOEAL DISEASE IN PUBLIC SCHOOLS 101826 KUTALIMBARU, PANCUR BATU SUB-DISTRICT, DELI SERDANG DISTRICT

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Abstract

Diarrhoeal diseases in the Medan City area, especially in Deli Serdang Regency, recorded 25934 cases while in 2023 there was a very significant increase of 33,771 cases of diarrhoea recorded at the Central Statistics Agency (BPS). The purpose of this study was to determine whether there is a relationship between personal hygiene and clean water sources. This research method uses Quantitative methods conducted through analytical surveys. The design used in this study was a cross-sectional survey. This research was conducted at SD Negeri 101826. The population of this study was 233 students, while the sample used was 70 students. The results showed that there was a significant relationship between personal hygiene (hand hygiene) and the incidence of diarrhoeal disease (p -value=0.001), there was a significant relationship between snacking habits and the incidence of diarrhoeal disease (p -value=0.001), there was no significant relationship between water sources and the incidence of diarrhoeal disease (p -value=0.127). Based on the above conclusions, it is expected that students of SD Negeri 101826 Tuntungan Pancur Batu can pay attention to personal hygiene both the habit of washing hands using soap after eating, drinking and after bathing to prevent the occurrence of diarrhoeal disease.

Keywords: Incidence of Diarrhoea, Water Supply, Personal Hygiene

Introduction

According to WHO and UNICEF, there are approximately 2 billion cases of diarrhoea globally each year, causing 1.9 million deaths of children under five. 78% of these deaths occur in developing countries, mainly in Southeast Asia and Africa. Data from the Komdat Kesmas from January to November 2021 showed that diarrhoea caused 14% of deaths in newborns. The 2020 Indonesian Nutrition Status Survey also showed that the prevalence of diarrhoea reached 9.8%. Diarrhoea is often associated with stunting, where recurrent diarrhoea in infants and toddlers can stunt their growth. According to Indonesia's 2020 Health Profile Data, diarrhoea is the leading infectious disease causing 14.5% of deaths in children aged 29 days to 11 months. In the same year, diarrhoea remained the leading cause of death, causing 4.55% of deaths in children under five (12-59 months) (Kemenkes 2024).

Based on data from the BPS (Central Bureau of Statistics) of North Sumatra Province in 2022, there were 205,155 cases of diarrhoea in all regencies/cities, with Medan City having the highest number of cases at 40,126 (BPS 2022).

Diarrhoeal diseases in the Medan City area, especially in Deli Serdang Regency in 2023, experienced a very significant increase of 33,771 cases of diarrhoea recorded at the Central Statistics Agency (BPS).

Diarrhoea is a symptom of infection that can be caused by various microorganisms, be it bacteria, viruses or parasites found in water that has been contaminated by faeces. Similarly, the incidence of diarrhoea in elementary school children makes researchers interested in conducting this research, then the principal at SD Negeri 101826 Kutalimbaru has confirmed that the incidence of diarrhoea often occurs in students at the elementary school. Thus the source of water that has been contaminated by human faeces can come from household waste. Usually, germs that cause acute diarrhoea are transmitted through oral fecal contact, be it direct contact with infected individuals or consumption of contaminated food and drink (Pertiwi, 2022).

Good personal hygiene should be of great concern to everyone, but some people take it for granted. Given the fastest transfer of bacteria from hands that have been contaminated with bacteria and faeces that are transferred to food. Hand washing with soap is a good step to kill and wash away dirty particles and microorganisms from hands that are washed in the right way. The habit of washing hands with soap can save one million children every year from diarrhoea cases, for this reason it is necessary to review the cases of diarrhoea that have occurred at SD Negeri 101826 Tuntungan. Based on the results of the researcher's observation at the school that the infrastructure in the school is not adequate for each student to do the habit of washing hands. Then the availability of clean water in quantity is inadequate, besides the habits of children who usually do not cultivate the habit of washing hands which can be the cause of diarrhoea.

SD Negeri 101826 Kutalimbaru is one of the primary schools located in Pancur Batu District, Deli Serdang Regency. The total number of students in SD Negeri 101826 Kutalimbaru is 233 students. The purpose of this study was to determine whether there is a relationship between clean water sources and personal hygiene with the incidence of diarrhoeal disease in SD Negeri 101826 Kutalimbaru Deli Serdang.

Methods

This research method uses quantitative methods conducted through analytical surveys. The design used in this study was a cross-sectional survey, in which observation of the subject was carried out only once with adjustments to existing variables during the research period. This research was conducted at SD Negeri 101826 Kutalimbaru. The population of this study was 233 students, while the sample used was 70 students who were calculated using the Lemeshow formula.

This study uses primary data, making questionnaires and tick sheets for measurement as instruments in data collection. Data were analysed univariately, showing each variable individually, and bivariately, finding relationships between variables and testing their hypotheses. Bivariate analysis used Chi Square test with 95% confidence level or $\alpha=0.05$.

Results and Discussion

Table 1. Frequency Distribution of Respondent Characteristics

Variabel	Frekuensi (f)	Persentase (%)
Age		
11 years	28	40.0
12 Years	39	55.7
13 Years	3	4.3
Gender		
Male	26	37.1
Female	44	62.9
Total	70	100

Based on age, most respondents were 12 years old, with a total of 39 students (55.7%), and a small proportion were 13 years old, with a total of 3 students (4.3%) and 11 years old as many as 28 students or around (40.0%). Based on gender, most respondents were female, with a total of 44 students (62.9%), and a small proportion of men, with a total of 26 students (37.1%).

Table 2. Univariate Data

Variabel	Frekuensi (F)	Persentase (%)
Hand Hygiene		
Good	28	40.0
Less Good	42	60.0
Snack Habits		
Good	24	34.3
Less Good	46	65.7
Source Of Clean Water		
Good	62	88.6
Less Good	8	11.4
Diarrhoeal Diseases		
Experienced	31	44.3
Not Experienced	39	55.7
Total	70	100

In the table above, it can be seen that in the hand hygiene variable, 28 students (40.0%) have good hand hygiene, while 42 students (60.0%) have poor hand washing habits. Based on the snack habit variable, 24 students (34.3%) have good snack habits, while 46 students (65.7%) have poor snack habits. Based on the clean water source variable, 62 students (88.6%) had good clean water sources, while 8 students (11.4%) had poor water sources. Based on the diarrhoeal disease variable, 31 students (44.3%) experienced diarrhoeal disease and 39 students (55.7%) did not experience diarrhoeal disease.

Table 3. Bivariate Data

TABLE 3.1. Diarrhoeal Diseases							
Variabel/Sub-Variabel	Diarrhoeal Diseases				Total		P-Value
	Experienced		Not Experienced				
	n	%	n	%	N	%	
Hand Hygiene							
Good	3	10.7	25	89.3	28	100	0.001
Less good	28	66.7	14	33.3	42	100	
Snack Habits							
good	3	12.5	21	87.5	24	100	0.001
Less good	28	60.9	18	39.1	46	100	
Diarrhoeal Diseases							
good	25	40.3	37	59.7	62	100	0.127
Less good	6	75.0	2	25.0	8	100	

The table analysis shows the association between the incidence of diarrhoeal disease and three different variables, namely hand hygiene, snacks and clean water sources. The table illustrates the number of respondents who suffered from diarrhoeal diseases and the number of respondents who did not suffer from diarrhoeal diseases, depending on whether they had good personal hygiene and clean water sources.

In the analysis of hand hygiene variables, it was seen that out of a total of 28 students who had good hand hygiene, 3 of them suffered from diarrhoeal disease (10.7%), while out of 42 students who had poor hand hygiene, 28 of them suffered from diarrhoeal disease (66.7%). The p-value was 0.001, indicating that there was a significant relationship between hand hygiene and the incidence of diarrhoeal disease.

In the analysis of the snacking habits variable, it was seen that out of a total of 24 students who had good snacking habits, 3 of them suffered from diarrhoeal disease (12.5%), while out of 46 students who had poor snacking habits, 28 of them suffered from diarrhoeal disease (60.9%). The p-value is 0.001, indicating that there is a significant relationship between snacking habits and the incidence of diarrhoeal disease.

In the analysis of the clean water source variable, it was seen that out of a total of 62 students who had good clean water sources, 25 of them suffered from diarrhoeal disease (40.3%), while out of 8 students who had poor water sources, 6 of them suffered from diarrhoeal disease (75.0%). The p-value was 0.127, indicating that there was no significant relationship between water source and the incidence of diarrhoeal disease.

Discussion

Relationship Between Hand Hygiene And The Incidence Of Diarrhoeal Disease

From the data presented in the table, it can be seen that out of a total of 28 students who have good hand hygiene, 3 of them suffer from diarrhoeal diseases (10.7%), while out of 42 students who have poor hand hygiene, 28 of them suffer from diarrhoeal diseases (66.7%). The proportion of diarrhoeal disease incidence tended to be lower among respondents who had good hand hygiene than those who had poor hand hygiene.

Statistical analysis showed a significant association between hand hygiene and the incidence of diarrhoeal disease, with a p-value of 0.001 < 0.05. This finding indicates that individuals who maintain good hand hygiene have a lower risk of developing diarrhoeal disease compared to those who do not

maintain good hand hygiene.

In this study, there were still many students who did not perform proper hand cleaning. This happens because most people do not wash their hands before eating using soap and running water. Many factors can cause children to not maintain their personal hygiene properly, such as lack of access to facilities such as sinks and handwashing soap. Hands are the part of the body that is most susceptible to illness as germs can stick to the skin of the hands, especially if you have long nails and often handle dirty objects. This is due to the fact that if you have long nails and often hold dirty objects or shake hands, disease bacteria will stick to the skin of your hands. People often do not wash their hands before eating or after handling pets or defecating. Handwashing with soap needs to be done five times: after contact with pets, after defecating, before preparing food, after caring for babies, and before eating. To ensure this hygiene is maintained, it is important for one to learn the technique of handwashing with running water and soap.

Relationship Between Snacking Habits and the Incidence of Diarrhoeal Disease

From the data presented in the table, it can be seen that out of a total of 24 students who have good snacking habits, 3 of them suffer from diarrhoeal diseases (12.5%), while out of 46 students who have poor snacking habits, 28 of them suffer from diarrhoeal diseases (60.9%). The proportion of diarrhoeal disease incidence tended to be lower among respondents who had good snacking habits than those who had poor snacking habits.

The results of statistical tests showed that the p-value of $0.001 < 0.05$, which means that there is a significant relationship between snacking habits and the incidence of diarrhoeal disease. This shows that respondents who have good snacking hygiene tend to have a lower risk of suffering from diarrhoeal disease compared to those who have poor snacking habits.

In this study, it is known that students' snacking habits are still not good, many students do not eat breakfast, so it is not uncommon for them to always consume snacks in the morning. Children often skip meals because they are busy at school. Those who do not eat breakfast tend to choose snacks at school. These snacks can contain biological and chemical pollutants as they often contain poor quality ingredients and are inadequately stored by manufacturers. It is important to take special precautions to avoid contamination, as school children often choose less healthy foods. These efforts are necessary to ensure the cleanliness and hygiene of the food or snacks consumed by school children.

Relationship Between Clean Water Source and Incidence of Diarrhoeal Disease

From the data presented in the table, it can be seen that out of a total of 62 students who had good water sources, 25 of them suffered from diarrhoeal diseases (40.3%), while out of 8 students who had poor water sources, 6 of them suffered from diarrhoeal diseases (75.0%). The proportion of diarrhoeal disease incidence tended to be lower among respondents with good water sources than those with poor water sources, however, the statistical test results showed that the p-value was $0.127 > 0.05$, indicating that this difference was not statistically significant.

Based on the p-value, there is no statistically significant relationship between clean water sources and diarrhoea cases. However, there was a significant difference in the number of respondents who experienced diarrhoea between the two groups. This suggests that, although not statistically significant, there is a tendency that respondents with less favourable water sources have a higher risk of suffering from diarrhoea.

In this study, it was found that some students used rivers and wells as sources of clean water for bathing, brushing teeth, and washing cutlery. Microorganisms can be airborne, causing diseases that are transmitted through the air or through air-contaminated equipment. Most of these diseases are caused by bacterial infections that spread through the fecal-oral route. Diarrhoea can be transmitted through faecal-contaminated fluids or objects, such as drinking water, hands or fingers, and food cooked in

equipment that has been contaminated with air.

Conclusions

Based on the results of statistical tests, there is a significant relationship between hand hygiene and the incidence of diarrhoeal disease, with a p-value of $0.001 < 0.05$. In addition, there is also a significant relationship between the habit of buying snacks and the incidence of diarrhoeal disease, with a p-value of $0.001 < 0.05$. However, there was no significant association between water source and the incidence of diarrhoeal disease, with a p-value of $0.127 > 0.05$.

Suggestion

Based on the above conclusions, it is expected that students of SD Negeri 101826 Tuntungan Pancur Batu can pay more attention to personal health, both the habit of washing hands using soap after eating, drinking and after bathing to prevent diarrhoeal diseases.

References

- [1] Adani, Diaz Faliha, and R. Azizah. "Faktor Risiko Keluhan Diare pada Balita di Indonesia Tahun 2016-2021: *Literature Review*." Media Publikasi Promosi Kesehatan Indonesia (MPPKI) 5.9 (2022): 1063-1073.
- [2] Suradyani, P.M. 2023 Hubungan Pengetahuan dan Perilaku Mencuci Tangan Pakai Sabun Pada Anak SDN 1 Kamasan Dengan Kejadian Diare. *Skripsi*. Denpasar: Politeknik Kesehatan Medan
- [3] Juliansyah, dkk.(2021).Faktor Yang Berhubungan Dengan Pencegahan Penyakit Diare Pada Balita di Puskesmas Tempunak Kabupaten Sintang. *Jurnal Kesehatan Masyarakat*. Vol.4, No.2.
- [4] Ariyanto, E. 2017. Dukungan Petugas Kesehatan dan Kader Posyandu Dengan Upayah Penanganan Diare Pada Balita (1-5 Tahun) di Kota Banjarmasin. *Jurnal Kesehatan Masyarakat*.
- [5] Fernando, S.P., dkk. (2024). Hubungan Personal Hygiene Dengan Kejadian Diare Pada Siswa Sekolah Dasar YPK Marauke. *Jurnal Kesehatan Indonesia*. Vol.3, No.1.
- [6] Haenisa, N. N., & Surury, I. (2022). Hubungan Personal Hygiene Dengan Kejadian Diare Pada Santri Di Kota Tangerang Selatan. *Jurnal Kesehatan Lingkungan: Jurnal Dan Aplikasi Teknik Kesehatan Lingkungan*, 19(2), 231-238.
- [7] Hutasoit, D. P. (2020). Pengaruh Sanitasi Makanan Dan Kontaminasi Bakteri Escherichia Coli Terhadap Penyakit Diare. *Jurnal Ilmiah Kesehatan Sandi Husada*, 9(2), 779- 786.
- [8] Ratnasari, N. (2021). Pengaruh Personal Hygiene Ibu Dengan Kejadian Diare Pada Balita Di Desa Langung Kecamatan Meureubo Kabupaten Aceh Barat (Doctoral Dissertation, Universitas Teuku Umar).
- [9] Virpy Elisanov S, P. (2018). Hubungan Perilaku Mencuci Tangan Dan Kebersihan Kuku Dengan Kecacingan Siswa Sdn 142 Pekanbaru (Doctoral Dissertation, Poltekkes Kemenkes Riau).
- [10] Pertiwi, A. H. (2022). Hubungan Kondisi Sarana Sanitasi Dasar Dengan Kejadian Diare Pada Balita Di Desa Babatan Wilayah Kerja Uptd Puskesmas Rawat Inap Katibung Kabupaten Lampung Selatan Tahun 2022 (Doctoral Dissertation, Poltekkes Tanjungkarang).