Jurnal Info Kesehatan
Vol. 22, No. 1, March 2024, pp. 199-205
P-ISSN 0216-504X, E-ISSN 2620-536X
DOI: *10.31965/infokes.Vol22Iss1.1635*
Journal homepage:*http://jurnal.poltekeskupang.ac.id/index.php/infokes*

RESEARCH **Open Access**

The Relationship of Latrine Quality with The Incidence of Worms in The Mekarsari Health Center Area, Lebak District

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Received: 10 February 2024 Revised: 12 February 2024 Accepted: 31 March 2024

Abstract
Family latrines, crucial for sanitation, impact community health. In 2019, Banten had 70.5% latrine use, below the national 72.3%. Poor sanitation causes diseases like helminthiasis, affecting many, especially children. This study aims to determine the relationship between the quality of family latrines and the incidence of helminthiasis in the Mekarsari Health Center area of Lebak Regency. The study used a cross-sectional design. The population included all families with goose-neck latrines in the Mekarsari Health Center area, with a sample size of 88 families. Data analysis was conducted in stages using the chi-square test at an alpha level of 0.05. The results showed that nearly all respondents (93.2%) were male, 96.6% were of productive age, most had low education levels (67%), and nearly all were non-civil servants (97.7%). The majority (73.9%) had a monthly income below the Lebak Regency minimum wage (< Rp 2,944,665). There were still 17% of families with low-quality latrines, and 9.1% of family members suffered from or were infected with helminthiasis (Ancylostoma duodenale). The relationship test results showed a significant relationship between latrine quality and helminthiasis incidence, with a p-value of 0.000 ($p<\alpha$). The OR value was 63,000, meaning that families with low-quality latrines were 63 times more likely to suffer from or be infected with helminthiasis compared to families with high-quality latrines. The conclusion is that there is a relationship between the quality of latrines and the incidence of helminthiasis in the Mekarsari Health Centre Area, Lebak Regency. Serious efforts are needed to empower families through health education and assistance to encourage them to improve, construct, and maintain quality latrines to prevent helminthiasis infections.

Keywords: Latrine Quality, Family Latrine, Helminthiasis.

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1. INTRODUCTION

Good sanitation is a crucial element supporting human health. The WHO defines sanitation as the provision of facilities and services for the disposal of human waste, such as urine and feces, and it also refers to maintaining hygienic conditions through waste management and wastewater treatment efforts (World Health Organization, 2019). Family latrines are an integral part of human waste disposal facilities. In 2019, 72.3% of families in Indonesia used permanent healthy latrines, while in Banten Province, the percentage was 70.5% (BPS Provinsi Banten, 2019).

Sanitation is closely linked to environmental health, which affects the overall health status of communities (Shrestha, et al., 2020; Holcomb, et al., 2020; Ferreira, 2021). Poor sanitation can negatively impact various aspects of life, including the quality of the living environment, contamination of drinking water sources, increased cases of diarrhea, and the emergence of several diseases. One of the diseases related to poor sanitation is helminthiasis (worm infection), a neglected tropical disease in Indonesia that can affect all ages but is more common in preschool and elementary school children. In 2014, the Central Bureau of Statistics recorded 932 cases of helminthiasis in West Sumba Regency (BPS Kabupaten Sumba Barat, 2014). This condition is alarming given the potential health impacts on families and communities.

Numerous efforts have been made by the government and the community to address this issue, but continuous effort and hard work are still needed. One approach to improving environmental quality, including enhancing human waste disposal facilities, is through community empowerment. Through community empowerment, it is hoped that people will increase their abilities, motivation, and participation in supporting welfare efforts by utilizing available community resources (Sukmawati, & Maryanti, 2022; Sabiq, Sulaiman, & Sugito, 2020).

This study aims to determine the relationship between the quality of family latrines and the incidence of helminthiasis in the Mekarsari Health Centre area of Lebak Regency. Given the conditions and impacts caused by the low quality of human waste disposal facilities (family latrines), it is necessary to conduct research and the results can be used by Puskesmas in empowering families and the Health Office in planning public health programs at the district/city level.

2. RESEARCH METHOD

This study is a cross-sectional design. The population in this study was all families who had family latrines (gooseneck) in the Mekarsari Health Centre area of Lebak Regency, with a sample size of 88 families. Data analysis was carried out in stages, namely, univariate analysis then bivariate analysis with a chi-square statistical test at alpha 0.05.

This study has received approval from the health research ethics committee of Semarang Health Polytechnic with number No. 0690/EA/KEPK/2023.

3. RESULTS AND DISCUSSION

Table 1. Distribution of Respondents' Characteristics by Age, Sex, Occupation, and Income in Mekarsari Health Centre Area, Lebak Regency

Characteristics	Frequency (f)	Percentage (%)
Age		
Elderly	3	3,4
Productive Age	85	96,6

Gender		
Male	82	93,2
Female	6	6,8
Education		
Low (< high school)	59	67,0
High (≤ high school)	29	33,0
Occupation		
Non-civil servant	86	97,7
Civil Servant	2	2,3
Income:		
< Lebak UMR (< IDR 2,944,665)	65	73,9
≥ Lebak UMR (≥ Rp.2,944,665)	23	26,1

Table 1 shows that the characteristics of respondents still found almost all respondents in the category of productive age, with almost all genders (93.2%) male. Most of them (67%) had low education (< SMA) with almost all of them (97.7%) working as non-civil servants, and most of them (73.9%) had monthly income below the minimum wage of Lebak Regency (< Rp. 2,944,665).

Table 2. Distribution of Respondents According to the Quality of Latrines and the Incidence of Helminths in the Mekarsari Health Centre Area, Lebak Regency

Variable	**Frequency (f)**	**Percentage (%)**
Quality of Family Latrines		
Not Qualified	15	17 %
Quality	73	83 %
Incidence of Diarrhoea		
Diarrhoea	12	13,6 %
No Diarrhoea	76	8 %
Incidence of Helminthiasis		
Worming	8	9,1 %
Not wormed	80	90,9 %

Table 2 shows that there are still 17% of families with unqualified latrines. Table 2 also shows that 9.1% of families still suffer from or are infected with helminthiasis (axylostoma duodenal).

Table 3. Distribution of Latrine Quality and Incidence of Helminths in Mekarsari Health Centre Area, Lebak District

Latrine Quality	**Incidence of helminthiasis**		**Total**	**p-value**	**OR**
	Helminthiasis	**No Helminthiasis**			
Not Qualified	7 (46,7 %)	8 (53,3%)	15 (100,0 %)	0,000	63,00
Qualified	1 (1,4 %)	72 (98,6 %)	73 (100,0 %)		
Total	8 (9,1 %)	80 (90,9 %)	88 (100,0)		

Table 3 shows that 46.7% of family members with helminthiasis were found in families with unqualified family latrines. The proportion was higher than that of families with good quality family latrines (1.4%). The results of the relationship test showed that there was a significant relationship between the quality of family latrines and the incidence of helminthiasis with a value of $p = 0.000$ ($p < \alpha$). The OR value of 63.000 means that families with unqualified

latrines have a sixty-three times greater risk of suffering or being infected with helminthiasis compared to families with qualified latrines to suffer from helminthiasis.

DISCUSSION

Respondent Characteristics

The respondents' characteristics varied, and those in the productive age group played a crucial role in community health development, particularly in improving the quality of family latrines. Productive age families can enhance their latrines by ensuring adequate water supply, maintaining proper distance from clean water sources, and keeping latrines clean. Similarly, male heads of households can be instrumental in maintaining, repairing, and ensuring the upkeep of latrines to meet quality standards. Despite the majority (67%) of respondents having low education levels (less than high school), this should not hinder achieving quality latrines, as the technology involved is not complex. With consultation and technical assistance from health workers at the Puskesmas, achieving high-quality family latrines is feasible. Almost all respondents (97.7%) are employed in non-government sectors (laborers, private sector, entrepreneurs), with the majority (73.9%) earning below the minimum wage of Lebak District (Rp. 2,944,665). This economic challenge necessitates efficient management of income to meet health needs, including investing in sanitary facilities (Delaire, et al., 2020; Rasul, 2020; Andrés, Joseph & Rana, 2021; Anderson, 2021; Howard, 2021; Kulkarni, et al., 2022).

Despite the limitations, families can gradually allocate funds from their earnings to build and maintain quality latrines. Support and empowerment through health education and assistance are crucial in helping families achieve a healthy environment by ensuring quality family latrines.

Family Latrine Quality and Worm Incidence

The study found that 17% of families do not have high-quality latrines, lower than the 67.8% reported by Mukhlasin, Encep Nugraha, and Solihudin in Serang District (Mukhlasin, Nugraha, & Solihudin, 2020). Although the proportion is smaller, neglecting this issue can still impact community health and lead to conditions such as helminthiasis (Riaz et al., 2020; Farrant et al., 2020; Leta et al., 2020; Werkman et al., 2020; Kjetland, et al., 2020; Phillips, et al., 2022). The study reported that 9.1% of families were affected by helminthiasis, which is lower than the 11.1% infection rate found in a study of elementary school children in Jakarta. Similarly, the West Sumba District Statistics Bureau recorded 932 cases of helminthiasis in 2014 (BPS Kabupaten Sumba Barat, 2019). This situation is concerning and calls for efforts to prevent it from compromising the health of family members.

Relationship Between Latrine Quality and Helminthiasis Incidence

The study shows a significant relationship between family latrine quality and helminthiasis incidence (p-value = 0.000). Families with poor-quality latrines are sixty-three times more likely to suffer from or be infected with helminthiasis compared to those with high-quality latrines. Poor sanitation facilities, such as inadequate or poorly maintained latrines, facilitate environmental contamination with human feces, which are a major source of STH eggs and larvae (Mosler & Bamberg, 2017; WHO, 2018; Cairncross & Feachem, 2019; Okoyo, et al., 2020; Tadege et al., 2022; Binga, et al., 2022;). Their guidelines and frameworks provide a comprehensive approach to improving sanitation and reducing the global burden of helminthiasis (WHO, 2018; UNICEF, 2019; Nalbone, Giarratana, & Napoli. 2021; Lo et al., 2022; Wolf, et al., 2023). This finding highlights the importance of maintaining good latrine quality to significantly reduce helminthiasis incidence among family members. Therefore, it is

crucial to promote family empowerment in owning and maintaining quality latrines that meet health standards, as this can contribute significantly to reducing helminthiasis cases.

4. CONCLUSION

The conclusion is that there is a relationship between the quality of latrines and the incidence of helminthiasis in the Mekarsari Health Centre Area, Lebak Regency. Serious efforts are needed to empower families through health education and assistance to encourage them to improve, construct, and maintain quality latrines to prevent helminthiasis infections.

REFERENCES

Anderson, D. M., Cronk, R., Fejfar, D., Pak, E., Cawley, M., & Bartram, J. (2021). Safe healthcare facilities: a systematic review on the costs of establishing and maintaining environmental health in facilities in low-and middle-income countries. *International journal of environmental research and public health*, *18*(2), 817.

Andrés, L., Joseph, G., & Rana, S. (2021). The economic and health impacts of inadequate sanitation. In *Oxford research encyclopedia of environmental science*.

Binga, W. E., Houmsou, R. S., Garba, L. C., Amuta, E. U., & Santaya, K. L. (2022). Use of rivers' water, inadequate hygiene, and sanitation as exposure of internally displaced persons (IDPs) to urogenital schistosomiasis and soil-transmitted helminthiasis in Jalingo Local Government Area (LGA), Taraba State, Nigeria. *Journal of Water, Sanitation and Hygiene for Development*, *12*(11), 792-802.

BPS Provinsi Banten. (2019). *Statistik Kesejahteraan Rakyat Banten 2019*. Banten: Badan Pusat Statistik.

BPS Kabupaten Sumba Barat. (2019). Statistik Kesejahteraan Rakyat Sumba Barat 2014. Sumba Barat: Badan Pusat Statistik.

Delaire, C., Peletz, R., Haji, S., Kones, J., Samuel, E., Easthope-Frazer, A., ... & Khush, R. (2020). How much will safe sanitation for all cost? Evidence from five cities. *Environmental Science & Technology*, *55*(1), 767-777.

Farrant, O., Marlais, T., Houghton, J., Goncalves, A., Teixeira da Silva Cassama, E., Cabral, M. G., ... & Last, A. (2020). Prevalence, risk factors and health consequences of soil-transmitted helminth infection on the Bijagos Islands, Guinea Bissau: A community-wide cross-sectional study. *PLoS Neglected Tropical Diseases*, *14*(12), e0008938.

Ferreira, D. C., Graziele, I., Marques, R. C., & Gonçalves, J. (2021). Investment in drinking water and sanitation infrastructure and its impact on waterborne diseases dissemination: The Brazilian case. *Science of the Total Environment*, *779*, 146279.

Holcomb, D. A., Knee, J., Sumner, T., Adriano, Z., de Bruijn, E., Nalá, R., ... & Stewart, J. R. (2020). Human fecal contamination of water, soil, and surfaces in households sharing poor-quality sanitation facilities in Maputo, Mozambique. *International Journal of Hygiene and Environmental Health*, *226*, 113496.

Howard, G. (2021). The future of water and sanitation: global challenges and the need for greater ambition. *AQUA—Water Infrastructure, Ecosystems and Society*, *70*(4), 438-448.

Kjetland, E. F., Gundersen, S. G., Zulu, S. G., & Taylor, M. (2020). Prevalence and intensity of neglected tropical diseases (schistosomiasis and soil-transmitted helminths) amongst rural female pupils in Ugu district, KwaZulu-Natal, South Africa. *Southern African Journal of Infectious Diseases*, *35*(1), 1-7.

Kulkarni, S., Hof, A., Ambrósio, G., Edelenbosch, O., Köberle, A. C., van Rijn, J., & van Vuuren, D. (2022). Investment needs to achieve SDGs: An overview. *PLOS Sustainability and Transformation*, *1*(7), e0000020.

Leta, G. T., Mekete, K., Wuletaw, Y., Gebretsadik, A., Sime, H., Mekasha, S., ... & Fenwick, A. (2020). National mapping of soil-transmitted helminth and schistosome infections in Ethiopia. *Parasites & vectors*, *13*, 1-13.

Lo, N. C., Bezerra, F. S. M., Colley, D. G., Fleming, F. M., Homeida, M., Kabatereine, N., ... & Garba, A. (2022). Review of 2022 WHO guidelines on the control and elimination of schistosomiasis. *The Lancet Infectious Diseases*, *22*(11), e327-e335.

Mukhlasin, Nugraha, E., & Solihudin. (2020). Sanitation Conditions and Their Impact on Public Health in Serang District. Journal of Environmental Health Research, 32(3), 156-165.

Nalbone, L., Giarratana, F., & Napoli, E. (2021). Balantidiasis: a neglected tropical disease used as a study model for a holistic approach to sustainable development in the framework of agenda 2030 goals. *Sustainability*, *13*(22), 12799.

Okoyo, C., Campbell, S. J., Williams, K., Simiyu, E., Owaga, C., & Mwandawiro, C. (2020). Prevalence, intensity and associated risk factors of soil-transmitted helminth and schistosome infections in Kenya: Impact assessment after five rounds of mass drug administration in Kenya. *PLoS neglected tropical diseases*, *14*(10), e0008604.

Phillips, A. E., Ower, A. K., Mekete, K., Liyew, E. F., Maddren, R., Belay, H., ... & Anderson, R. (2022). Association between water, sanitation, and hygiene access and the prevalence of soil-transmitted helminth and schistosome infections in Wolayita, Ethiopia. *Parasites & Vectors*, *15*(1), 410.

Rasul, G. (2020). A framework for improving policy priorities in managing COVID-19 challenges in developing countries. *Frontiers in Public Health*, *8*, 589681.

Riaz, M., Aslam, N., Zainab, R., Aziz-Ur-Rehman, Rasool, G., Ullah, M. I., ... & Akram, M. (2020). Prevalence, risk factors, challenges, and the currently available diagnostic tools for the determination of helminths infections in human. *European Journal of Inflammation*, *18*, 2058739220959915.

Sabiq, A., Sulaiman, A. I., & Sugito, T. (2020). Designing Family Empowerment Program: Community Education in Times of Covid-19 Pandemic. *International Educational Research*, *3*(3), 22-p22.

Shrestha, A., Six, J., Dahal, D., Marks, S., & Meierhofer, R. (2020). Association of nutrition, water, sanitation and hygiene practices with children's nutritional status, intestinal parasitic infections and diarrhoea in rural Nepal: a cross-sectional study. *BMC public health*, *20*, 1-21.

Surya, B., Suriani, S., Menne, F., Abubakar, H., Idris, M., Rasyidi, E. S., & Remmang, H. (2021). Community empowerment and utilization of renewable energy: Entrepreneurial perspective for community resilience based on sustainable management of slum settlements in Makassar City, Indonesia. *Sustainability*, *13*(6), 3178.

Sukmawati, D., & Maryanti, R. (2022). Development of education and economic circulation in supporting local potential as community empowerment efforts amid the Covid-19 pandemic. *Indonesian Journal of Multidiciplinary Research*, *1*(2), 235-250.

Tadege, B., Mekonnen, Z., Dana, D., Sharew, B., Dereje, E., Loha, E., ... & Levecke, B. (2022). Assessment of environmental contamination with soil-transmitted helminths life stages at school compounds, households and open markets in Jimma Town, Ethiopia. *PLOS Neglected Tropical Diseases*, *16*(4), e0010307.

UNICEF. (2019). The State of the World's Children: Children, Food and Nutrition. UNICEF.

Werkman, M., Wright, J. E., Truscott, J. E., Oswald, W. E., Halliday, K. E., Papaiakovou, M., ... & Anderson, R. M. (2020). The impact of community-wide, mass drug administration on aggregation of soil-transmitted helminth infection in human host populations. *Parasites & Vectors*, *13*, 1-12.

Wolf, J., Johnston, R. B., Ambelu, A., Arnold, B. F., Bain, R., Brauer, M., ... & Cumming, O. (2023). Burden of disease attributable to unsafe drinking water, sanitation, and hygiene in domestic settings: a global analysis for selected adverse health outcomes. *The Lancet*, *401*(10393), 2060-2071.

WHO. (2018). Guidelines on Sanitation and Health. World Health Organization.

World Health Organization. (2019). *Water, sanitation, hygiene and health: a primer for health professionals* (No. WHO/CED/PHE/WSH/19.149). World Health Organization.