

Correlation Parents' Knowledge and Environmental Sanitation Towards The Helminthiasis in Students

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Abstract

Purpose: The objective of this study is to determine whether parental knowledge about worms and environmental sanitation are related to the incidence of worms (helminthiasis) among students in SDN 02 Selokaton.

Methodology: This study uses an analytical observational study research method with a cross-sectional research design.

Results: there is no significant relationship between parental knowledge about worms and the incidence of worm infections, there is no significant relationship between environmental sanitation and the incidence of worm infections.

Applications/Originality/Value: The novelty in this study is that no data has been found on the prevalence of worms in elementary school students in Karanganyar, so this study can be an initial screening of the prevalence of worms in elementary school students in Karanganyar.

Keyword: Parents' knowledge, environment sanitation, helminthiasis

Introduction Section

Helminthiasis or known as worms is an infestation disease caused by parasites in the form of worms. This infection is most common worldwide and is transmitted through eggs in human feces which then contaminate the soil in areas with poor sanitation. Eggs can be transmitted to vegetables when the vegetables are not cooked, washed or peeled carefully (Bokhari, 2021). In addition to humans, these worms can also manifest in animals, both livestock and pets (National Health of UK, 2023). The prevalence of worms according to World Health Organization data in 2023, an estimated 24% of the world's population or 1.5 billion people have been infected. The prevalence of helminthiasis in Southeast Asia including Indonesia, the Philippines, Myanmar is still very high with a percentage of 50% -80% (Tapiheru, 2021). The prevalence of worms in Indonesia itself is generally still very high, especially in the underprivileged population, with poor sanitation varying between 2.5% - 62% (Kemenkes, 2017). The prevalence of worm infections in Indonesia varies in the range of 45-65% and can even reach 80% in areas with poor sanitation (Nasution et al., 2019). On Armiyanti (2023) research state The prevalence of STH infection in Indonesia varies, between 20-86% 4. Research on the incidence of STH infection in several regions in Indonesia shows varying percentages, including East Java Province at 7.95%, Central Java Province at 33.8%, Bali Province at 13.5%, and North Sumatra Province at 60.4%.

The impact of worms is a decline in health, nutrition, intelligence, and productivity, so that economically it causes many losses and also can causing loss of carbohydrates and protein and loss of blood, thus reducing the quality of human resources. lack of knowledge about personal hygiene, poor environmental sanitation, socio-economic conditions and not being accustomed to living a clean and healthy lifestyle means that Helminthiasis is one of the diseases that is often underestimated and ignored. Whereas, The environment and personal hygiene play the most important role in the health status of children in both rural and urban areas (Ayu, 2020). The age group most likely to experience worms is 5-15 years, because at that age children often play on the ground barefoot and do not pay attention to personal hygiene (Bestari, et al 2021). Infections caused by these worms generally do not cause serious illness, but in severe infestations, worms can lead

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to mistaken analysis for other diseases and can be a fatal case (Soedarto, 2016). The main species that infect humans are *Ascaris lumbricoides*, *Trichuris trichiura*, *Necator americanus* and *Ancylostoma duodenale* (World Health Organization, 2023). Non-Soil Transmitted Helminth worm species are a group of intestinal nematodes that do not require soil for their life cycle. Some of the species that infect are *Enterobius vermicularis*, and *Strongyloides stercoralis* (Irawan, 2024)

In Murti's study (2016) it was concluded that there was a significant relationship between the level of maternal knowledge about worms (Soil Transmitted Helminths infection) and the incidence of Soil Transmitted Helminths infection, namely with a significance value (p) of 0.000 ($p < 0.05$). According to the results of Aisyah's study (2019) The results of the bivariate test for the level of knowledge with the incidence of worms obtained $p = 1.000$, meaning that it can be concluded that there is no statistically significant relationship between knowledge of worms and the incidence of worms with prevalence (94.3%). In a study of the relationship between home environmental sanitation and the incidence of worm infections in elementary school children at SD Barengan, Teras District, Boyolali Regency, it was found that floor conditions were $p = 0.005$, availability of clean water $p = 0.005$, ownership of toilets $p = 0.500$, trash bins $p = 0.000$ and wastewater disposal facilities $p = 0.000$ so that related results were obtained (Mahmudah, 2017). Rahma's (2020) study found no relationship between home environmental sanitation and the occurrence of worms ($p = 0.556$). Around the school there is a garbage dump and it is close to the plastic industry. The facilities at SDN 02 Selokaton have also not been used properly with several water sources that are not evenly distributed. The novelty in this study is that no data has been found on the prevalence of worms in elementary school students in Karanganyar, so this study can be an initial screening of the prevalence of worms in elementary school students in Karanganyar.

Method

This study used an observational method with a cross-sectional approach to analyze the incidence of worms which can be influenced by parental knowledge and environmental sanitation conditions to students of SDN 02 Selokaton. The target population in this study were students of Elementary School 2 Selokaton, Gondangrejo with the sample and subjects to be studied in this research are students in grades 5 and 6. The sampling technique in this study used the simple random sampling technique by collecting students from grades 5 and 6. The research instrument using a questionnaire will be used to measure parental knowledge about worms and environmental sanitation and continued with a stool examination to detect the presence of worm eggs and aims to determine the incidence of worms among students.

Results and Discussion

Worm disease is an infestation with one or more intestinal parasitic roundworms including whipworms, hookworms, and roundworms that are transmitted through eggs found in human feces. Eggs are ingested from contaminated water sources and soil, and worms can be transmitted through feces and ingested by children who play in the soil and then put their hands in their mouths in the fecal oral process (Bokhari, 2021) (Adiguna *et al*, 2022). There are factors that influence worm infections, namely tropical climate, low awareness of cleanliness, personal hygiene, low socio-economic conditions, and population density (Agustina, 2021) (Amalia *et al*, 2022). Otherside, Poor sanitation in bathroom management and waste management is closely related to how environmental sanitation is maintained (Heickal *et al*, 2021).

This research has gone through several stages starting from October and November which took place at SDN 2 Selokaton, Gondangrejo, Karanganyar. This research has gone through several stages starting from October and November which took place at SDN 2 Selokaton, Gondangrejo, Karanganyar. This research obtained 68 research subjects from students attached to the following table.

Table 1. Univariate Test Result

Variables	Frequency	Percent
Parental knowledge about worms		
<i>Good</i>	36	(52.9%)
<i>Moderate</i>	32	(47.1%)
Environmental sanitation		
<i>Good</i>	58	(85.3%)
<i>Moderate</i>	10	(14.7%)

Worm Infection (<i>Helminthiasis</i>)		
<i>Positive</i>	13	(19.1%)
<i>Negative</i>	55	(80.9%)

After testing each variable using a univariate test, it was found that regarding parents' knowledge about worms, 36 respondents answered well and 32 respondents answered with moderate knowledge about worms. Testing was also carried out on environmental sanitation conditions with 58 respondents (85.3%) having good environmental conditions and 10 respondents (14.7%) having fairly good or moderate environmental conditions. After testing feces samples in the FK UMS parasitology laboratory, it was shown that 13 (19.1%) respondents tested positive for worms, while 55 (80.9%) other respondents tested negative for worms. Then, from these variables, a bivariate test was also carried out and the following results were obtained.

Table 2. Correlation Test Result

Correlation	p-value
Worm Infection - Parental knowledge about worms	0,196
Worm Infection – Environment sanitation	0,071

After conducting an analysis using the Spearman correlation test, the results obtained were insignificant between the correlation of parental knowledge about worms and the infection of worms with *p value* (0,196) or >0.05 . This is not in line with the research of Arinda & Buana (2023) which stated that the incidence of worm infections is also influenced by the level of knowledge, practice, and healthy lifestyle attitudes, but the research results showed that 36 respondents (52.9%) had good knowledge of worms and 32 respondents (47.1%) had a moderate level of knowledge. Research on helminthiasis (worm infections) reveals mixed findings regarding the correlation between parental knowledge and infection rates. While some studies found no significant relationship between knowledge levels and helminthiasis incidence (Hadijah et al., 2021). The insignificant results are in line with Nurwahida's (2024) research which showed a *p value* = 0.207, so the *p value* > 0.1 . It shows that there is no correlation between the two variables and the worms in children with a prevalence of (48.6%). The incidence of worm infections is also influenced by the level of knowledge, practice and attitude towards a healthy lifestyle. Knowledge is a very important thing in a person's behavior, knowledge about health is a continuing societal problem until now which includes the lack of public awareness in maintaining cleanliness of both themselves and the environment (Suraini *et al.*, 2018).

The condition of low level of maternal knowledge will affect the lack of attention or poor parenting patterns of mothers towards children, especially in terms of how to maintain cleanliness and health, this is line with previous research that maternal knowledge is related to worm infection (*p value* = 0.00) where maternal knowledge is a protective factor against the occurrence of worm infection (Murti *et al.*, 2016). Nurwahida's (2024) research found that the percentage of respondents with poor knowledge who tested positive for worms was 14.3%, so that a person's low level of knowledge can influence a person's actions in their daily lives, although the results of this study were also not significant when associated with parental knowledge. although in this study it is not linear with the research conducted by Sigalingging (2019) The results of the statistical test obtained a *p value* = 0.000, it can be concluded that there is a significant relationship between knowledge and prevention of worms with a prevalence of (41.3%). Bestari's research (2021) obtained results where a sig value of 0.022 or *p value* <0.05 was obtained, so it was concluded that there was a significant relationship between the level of knowledge of the incidence of worms and the prevalence of worms (3.9%).

Analysis of the relationship between environmental sanitation and the incidence of worms did not produce significant test results after conducting the Spearman test with a *p value* (0.071) or >0.05 . Definitively, environmental sanitation is an activity aimed at improving and maintaining basic environmental conditions that affect human well-being (Fattah et al., 2020). The results of the analysis showed that 58 respondents or (85.3%) had good home sanitation while 10 respondents (14.7%) had adequate sanitation, So that the criteria and requirements according to Elvira's research (2022) which states that support achieving optimum health levels are the physiological conditions of the house including meeting the standard requirements for construction, wall materials, floors, doors, windows, ceilings, lighting, ventilation, sound intensity, the presence of rooms, bedrooms, bathrooms, kitchens, and children's play areas have been conditioned and also important In waste disposal systems such as toilets, it is important to note that septic tanks as a place to dispose of excreta must meet the requirements as a place of disposal both from households and from outside. It is stated that in 2022, 57% of the global population (4.6 billion people) use safely managed sanitation services; 33% (2.7 billion people) use private sanitation facilities connected to sewerage systems. Twenty-one percent (21%) or 1.7 billion people) use toilets or latrines where excreta are disposed of safely (WHO, 2023). These results are also inconsistent with Amalia's research (2022) which

showed that out of 23 respondents in the worm group, 17 respondents (74%) had poor water hygiene. In addition, the results of the study also showed that out of 23 respondents in the worm group, 19 respondents (83%) had poor waste management.

Environmental sanitation is an activity aimed at improving and maintaining basic environmental conditions that affect human well-being (Fattah *et al.*, 2020). The problems that generally occur are low awareness and knowledge in managing environmental sanitation and personal hygiene habits. The purpose of maintaining environmental sanitation is very important to improve a person's health, maintain body hygiene and prevent disease. Examples of the application of environmental sanitation can be the provision of clean water, toilet management, bathroom management, and waste management. The relationship between personal hygiene is closely related to how environmental sanitation is maintained (Heickal *et al.*, 2021). As mentioned above, children aged 6 to 12 years or when they enter elementary school often experience worms because at that age they always play with dirt. Worm infections experienced by elementary school children are related to personal hygiene and sanitation carried out daily such as cutting nails, bathing twice a day, washing hands, using footwear. Worm infections can be influenced by knowledge, practices, and healthy living attitudes carried out daily (Rahmawati *et al.*, 2024). of course the results of this study are contrary to the research conducted and obtained by Fattah (2020) which shows that there is a relationship between clean water ($p = 0.002$), cleanliness of defecation ($p = 0.009$), and waste disposal ($p = 0.048$) with the occurrence of worms. In Nurwahida (2024) shows p value = 0.001 then p value < 0.1 . Seeing the relationship between environmental sanitation and the occurrence of worms in children with a prevalence (40.0%). so that there is not only 1 factor that can influence the two variables studied.

Apart from environmental sanitation factors, worm infections are also influenced by low body immunity, which causes worm infections, as in Agrawal's (2020) study that infections can be affected by other health issues, especially in people with weakened immune systems, such as those with HIV. Nutritional status and infection have a reciprocal relationship with each other. Individuals with malnutrition will be more susceptible to infection due to decreased immunity, while infection will affect nutritional status and cause malnutrition (Yang *et al.*, 2021). The main factor causing worm infections in children is poor environmental sanitation and personal hygiene, personal hygiene behavior such as washing hands, cutting nails and using footwear can have a big influence because long nails can be a comfortable place for microorganisms including worms to live. Regular use of footwear when outside can also protect against worm infections because worms can also enter the body through non-intact skin or injured skin surfaces so that the portal of entry for worms into the body is wide open, not only is the surface of the skin on the feet at risk of being infected with worms, but it can also occur through the surface of the palms of the hands which are not sterile and dirty, causing contamination. On the other hand, contaminated food on the ground and without a cleaning or processing process can be an opportunity for worm infection through the oral mechanism. that mentioned in Kihoro's research (2024) that economic factors, use of clean water as a source of life, use of footwear and personal hygiene. Risk factors for worms state that consumption of dirty food, dirty water and contact with infected water as routes of transmission. Sociodemographic factors are very potential factors such as education, occupation, location of residence (rural or urban), ethnicity, and gender (Armiyanti, 2023).

In Heickal's study (2021) Personal hygiene is related to worm infections in toddlers (p value = 0.003). Personal hygiene includes the mother's habit of washing her hands (p value = 0.039), the habit of wearing footwear (p value = 0.002), and the cleanliness of the mother's and child's nails (p value = 0.041) showing a relationship with worm infections in children. in a study conducted by Sri Kartini (2016) in Pekanbaru, it showed a significant relationship between hand washing habits (p value = 0.001), nail cleanliness (p value = 0.001), and cleanliness of playing on the ground (p value = 0.019). Students who do not have the habit of washing their hands are 7 times more at risk of being infected with worms compared to students who have the habit of washing their hands. Students who have a habit of playing on the ground are 2 times more at risk of being infected with worms compared to students who do not have a habit of playing on the ground. Students who have dirty nail hygiene are 4 times more at risk of being infected with worms than those who have clean nails and hands.

When viewed when conducting research directly at school, the condition of the school environment still meets the standards because the school environment is not directly based on soil but has a cement base and many students there have also been regular in using footwear when playing. It's just that the facilities for using a hand washing place are still minimally used and behind the school there are also former garbage dumps. Technological advances can also help parents' access to knowledge about worms, so that when filling out the questionnaire, the majority of parents already know things related to environmental cleanliness and worms. the role of the government in providing routine worm medicine through the nearest health facility program or community health center.

Discussing the number of positive cases of worms in this study, there were 13 (19.1%) positive cases and 55 (80.9%) negative cases, The most common type of worm is hookworm with a total of 8 (61.5%) then followed by *Ascaris*

lumbricoides and the least is *Enterobius Vermicularis*. Tapiheru's (2021) study showed that the number of students infected with STH was less than the number of students who were not infected. Where 26 students (29.9%) were positive for STH infection and 61 students (70.1%) were negative. In Lubis's (2018) study, as many as 50 stool samples were obtained, it was found that 23 (46%) toddlers were infected with STH. While 27 (54%) other toddlers were not infected with STH. In Rahmawati's (2024) research, 1 (3.22%) sample was found to be positive for worms and 30 (96.78%) were declared negative. From several studies with positive and negative results, negative results were more dominant, thus indicating that the worm factor is not just one factor but is greatly influenced by various factors. However, if cases of worm infection are found, it is necessary to pay attention to and prevent clinical manifestations due to worms. Soedarto (2016) mentioned the clinical manifestations of several types of STH and non-STH worms such as Loeffler's syndrome, pneumonia, urticaria, fever, digestive disorders, anemia, bloody diarrhea, abdominal pain, nausea and vomiting, rectal prolapse, itching in the anal area, enuresis, dermatitis, pruritus and bronchitis even microcytic hypochromic anemia with pale conditions, a distended abdomen, dry and easily falling out hair.

Conclusions

The results of the analysis showed that there was no significant relationship between parental knowledge about worms and environmental sanitation towards the incidence of worm infections. Although there was no significant relationship, this study highlights the existence of other factors that potentially influence the incidence of worm infections, such as healthy living practices and parental mental attitudes. This study confirms that parental knowledge about worms and environmental sanitation conditions alone are not enough to determine the incidence of worm infections without additional factors like economic factors and personal hygiene. Therefore, further efforts are needed to increase awareness and more holistic preventive practices. The limitations of this study are that this study was only conducted through subjective observations and did not conduct objective observations and not all respondents collected feces samples or questionnaires.

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