

Health Problems Associated with Use of Pit Toilets Among Secondary School Students in Gokana Local Government Area

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Article History	Abstract
Original Research Article	<p><i>In a community where a centralized sewage system is absent, the pit toilet is the most prominent alternative, the common health problems associated with the use of pit toilet are mostly those diseases that occur via the faeco-oral transmission route. This study investigated the health problems associated with use of pit toilets among secondary school students in Gokana Local Government Area, Rivers State. A descriptive cross sectional design was adopted with a population consisting of all students in public schools in Gokana LGA, Rivers State. The sample size of 400 was selected using a systematic sampling technique. A structured questionnaire with a reliability coefficient of 0.88 was used. Data was analyzed with the aid of the Statistical Products for Service Solutions (SPSS version 26), using percentage and Chi-square at 0.05 level of significance. The finding of the study showed that among those who used pit toilet, 41.9% had worm infection, 37.9% had dysentery, 28.6% had cholera, 21.7% had diarrhea, and 81.8% had skin problem. Statistically significant association was found between use of pit toilet and diarrhea (X^2-value = 122.81, $df = 1$, $p = 0.00$), dysentery (X^2-value = 72.15, $df = 1$, $p = 0.00$), cholera (X^2-value = 79.77, $df = 1$, $p = 0.00$), worm infection (X^2-value = 60.17, $df = 1$, $p = 0.00$), and skin problem (X^2-value = 61.95, $df = 1$, $p = 0.00$). It was concluded that, the health problems associated with use of pit toilets were diarrhea, dysentery, cholera, worm infection, and skin problem. It was recommended among others that the government should provide resources for the expansion of accessible, clean sanitation with accompanying health education and targeted outreach for vulnerable school populations. Also, community stakeholders should reinforce the importance of integrating sanitation infrastructure upgrades into worm control programs by working in collaboration with the community healthcare workers.</i></p> <p>Keywords: pit latrines, sanitation hygiene, fecal-oral transmission, diarrheal diseases, helminth infections, school health, cross-sectional study, Rivers State, Nigeria.</p>
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Introduction

The pit toilet system is a basic sanitation facility that is still widely used in Sub-Saharan Africa and Nigeria particularly in rural and semi-urban areas lacking complex sewage systems. The pit toilet facility basically consists of a pit that collects human excreta beneath a simple shelter, it can effectively ensure feces is separated from human contact when properly constructed with a slab, a water seal or ventilation pipe, but in most rural communities, the pit toilets lack these improvements making them unhygienic. While Pit latrines offer a basic form of sanitation, they can harbor a multitude of health risks for students if not

properly maintained as lack of regular emptying, and inadequate cleaning often lead to groundwater pollution, odor, and can become breeding sites for disease vectors (Hinton, 2024)

African is faced with severe resource constraints that impact the availability of sanitation facilities. The WHO/UNICEF JMP (2023) report stated that 780 million people in Africa lack even a basic sanitation service with 193 million still practicing open defecation. The report further stated 3 out of 4 people in rural areas lacked safely managed sanitation, and 4 out of 5 lack basic hygiene

services; a stark reminder of the level of exposure to health risks among the African populace. At current pace of progress, no country in Africa is on track to achieve universal access to safely managed sanitation by 2030. However some progress has been made as 9 countries are on track to eliminate open defecation by 2030 (WHO/UNICEF JMP, 2023).

In Nigeria, the case is not so different as UNICEF (2019) data reveals 56% of Nigerians use pit latrines (most of which are unhygienic), 26% have no facility at all, and 18.4% still defecate openly. Nigeria actually experienced a decline in access to improved sanitation which dropped from 38% of the population in 1990 to 29% in 2015 due to rapid population growth. Within the same period, the proportion of the population defecating in the open also increased from 24% to 25% (UNICEF/WHO, 2015). Assessments by Oloruntoba and Odafiwotu (2019) in Yenagoa, Bayelsa State revealed that only 46.7% of public secondary schools had basic sanitation services, while 20% had no sanitation service at all. The study showed toilet-to-student ratios of 1:760, this was far beyond WHO recommended toilet-to-student ratios of 1:25 for girls and 1:50 for boys. Rural households in Rivers State face severe deficits in access to sanitation facilities, a decade long study in the Lower Orashi Basin area of Rivers State showed only about one in five households had improved facilities (22 %) while the rest practiced open defecation (Arokoyu & Ukpere, 2014). Ordinioha and Owmondah (2014) reported 67.7 % of households owned latrines in Ogbogu, a semi-urban community, in more remote riverine villages the proportion falls well below 50%. This shortfall in usage in the rural areas have been attributed to insufficient funds to build hygienic pit latrines, flooding of pits in rainy seasons, perceived lack of safety (dark, structurally unsound), and poor cleanliness due to infrequent emptying. The Rivers State Ministry of Water Resources and Rural Development (2012) opined that the vast majority of existing latrines in rural areas are unimproved pit toilets (without slabs or ventilation), leading to contamination risks and user dissatisfaction. Institutional mandates of agencies under the Rivers State Ministry of Water Resources and Rural Development have been to achieve 100 % sanitation goal by 2025, but these goals have suffered setbacks due to poor funding, logistical challenges, poor commitment of government to human capital development and weak community engagement.

The pit latrine system is most prominent in rural communities and secondary schools where centralized sewerage is absent due to its low capital cost and ease of construction. This reflects a considerable lack of sufficient human and financial resources to implement sanitation policies and plans in rural areas in Nigeria. A standard

improved pit latrine facility should have a depth of 2 m or more, slab of any material, drop-hole cover, wall, roof, door, and hand washing facilities (water and soap). The WHO/UNICEF classified ventilated-improved (VIP) latrine, pit latrine with slab and composting toilet as improved sanitation facilities while the pit latrine without slab/open pit, bucket hanging toilet/hanging latrine, no facilities or bush or field are unimproved sanitation facilities. The WHO (2023) recommends more must be done to strengthen sanitation and hand hygiene systems in order to achieve SDG 6.2 on sanitation and hygiene in Sub-Saharan Africa.

The common health problems associated with the use of pit toilet are mostly those diseases that occur via the faeco-oral transmission route such as diarrhoea disease, dysentery, cholera and worms, the skin problem like measles. Diarrhoea disease, characterized by loose watery stools along with other symptoms like abdominal cramps, bloating and dehydration is a common illness associated with poor sanitation; it is caused by bacteria, virus or parasites and spread through contaminated foods and water. Diarrhoea causes malnutrition and dehydration in children due to the loss of fluid increasing their susceptibility to diseases. Mabvouna et al. (2023) showed a significant association between incidence of diarrhoea and the use of pit latrines (p -value = 0.00). Indeed, 68.9% of diarrhoea cases were recorded in households using pit latrines against 31.1% in households with water-based toilet (flush toilet). However, multiple longitudinal and case control studies demonstrate that access to improved pit latrines significantly reduces the incidence of childhood diarrhoea. For instance Cha et al. (2024) in a comparative study of well-constructed versus poorly constructed pits found that households with properly built latrines experienced 54% lower odds of child diarrhoea compared to those with unimproved pits (aOR 0.46; 95 % CI 0.27–0.81). This indicates that pit latrine lacking features like hole covers or slabs are associated with higher rates of diarrhoea, this was highlighted by Mabvouna et al. (2023) which reported 81.4 % of paediatric diarrhoea cases occurred in homes with uncovered pits versus only 18.6 % in those with covered pits ($p < 0.001$). However Cha et al. (2023) opined that children with access to pit toilets were less prone to diarrhoea disease compared to those without access signifying the role of pit latrines in reducing incidence of diarrhoea cases. These reviewed studies highlight the need for improved sanitation to break the chain of transmission of diarrhoea disease.

Dysentery manifests as bloody, mucus-laden diarrhoea caused primarily by *Shigella* bacteria and thrives where there is undue contact with faecal matter. It is a more severe form of diarrhoea, responsible for an estimated 165 million cases of diarrhoea and approximately 1.1 million deaths

annually, predominantly among children in low- and middle-income countries (Nyarkoh et al., 2014). It leads to loss of fluid, dehydration and malnutrition, victims would usually need rehydration therapy. The WHO (2024) highlights that poor sanitation such as unimproved pit latrines promotes dysentery outbreaks via flies and direct faeco-oral routes. A study of dysentery among households in Bangladesh revealed higher fly counts around pit-latrines drop-holes and frequent environmental contamination of water and surfaces with *Shigella* indicating pit latrines act as both reservoirs and transmitters of dysentery. (George et al., 2015)

Cholera is an intestinal bacterial infection with diarrheal like symptoms caused by *Vibrio cholera* and occurs in areas with poor sanitation facilities like the unimproved pit latrine. The bacteria spread via contaminated food, water or surfaces. Epidemiological studies in Nigeria show a correlation between cholera burden and poor access to good sanitation facilities, the study explicitly classified unimproved pit latrines (those without slabs or ventilation) as risk factors for cholera transmission (Nygren et al., 2014) The CDC (2024) recommends siting pit toilets at least 30m from water sources to reduce cholera risk indicating that proximity to water source promotes the spread of cholera. A recent study by Mukonka (2024) revealed a positive correlation between number of cholera cases and the number of toilets outside houses ($\rho=0.307$, $p<0.001$) and pit latrines ($\rho=0.354$, $p=0.001$). However, the presence of pit latrine may not solely account for the occurrence of cholera or be sufficient to break cholera transmission without the provision of WASH systems.

The use of pit toilet has been linked with the occurrence of soil-transmitted intestinal worms such as hookworm, roundworm (*Ascaris lumbricoides*), and whipworm. Children from homes using pit toilet are often prone to intestinal worms, Omotola and Ofoezie (2019) showed 48.4% of pupils from homes with pit latrines were infected with worms compared with 20.5% from water closet households in southern Nigeria ($p=0.001$). Similarly Strunz et al. showed the evidence of associations between worm infection and latrine access in a systematic reviews. Interestingly even improved pit latrines do not guarantee the elimination of worms, as Steinbaum et al. (2019) showed the existence of intestinal worm eggs in soil samples two years after installing improved pit toilets. Another study showed school-aged children in Calabar using pit latrines had double the likelihood of worm infection compared to those using flush toilets (OR = 2.1; 95% CI: 1.3–3.4; $p=0.002$) (Usang et al., 2025). The improvement in sanitation facilities is necessary to reduce occurrence of worm infestations.

Several pit toilets are often damp, filthy, and covered in fecal matter, which can directly contact skin especially on hands, feet, and buttocks leading to rashes, irritation, and dermatitis. This is also an ideal environment for the growth of fungal infections. A study by Trisnaini et al. (2025) showed the incidence of skin diseases was associated with type of latrine with users of pit toilet having more skin problems ($p\text{-value} = 0.002$). Skin problems affect approximately 900 million people worldwide at any given time (WHO 2018). It impacts their appearance and daily life. A high burden of infectious skin diseases such as scabies, fungal infections, and leishmaniasis is common in low income countries. Aswanda et al. (2023) stated the incidence of skin problems is common in the presence of poor sanitation and poor personal hygiene. Poor sanitation due to inadequate clean water sources, poor housing conditions, and the presence of disease vectors, is a major risk factor for skin health problems (Zahtamal., 2022). A case report series from rural South Africa documented *Latrodectus* spider bites occurring in pit latrines. Msiwa and Ntshalintshali (2019) described three cases where individuals were bitten by venomous spiders while using rural pit toilets. One required antivenom for severe systemic effects. This highlights that simple pit latrines may expose users to harmful arthropods, causing acute dermal and systemic injury. Moreover, neglected skin infestations like scabies are linked to hygiene and sanitation. Zewude et al. (2024) explicitly attributed infestations to poor environmental sanitation and lack of personal hygiene among Ethiopian street children.

A personal observation of the sewage infrastructure in rural areas of Rivers State shows a heavy reliance on pit latrine due to its cost effectiveness and low maintenance cost whereas the city center uses a combination of conservancy tanks, traditional pit latrines, ventilated pit latrines, jetty toilets and direct river flush toilets. Gokana as a rural settlement relies extensively on the pit latrine as a practical and reliable method of sewage disposal, however most facilities do not meet the standard of an improved pit latrine system creating unhygienic conditions and predisposing vulnerable individuals specifically children and the elderly to diseases. It was against this background the researcher undertook the study to investigate the health problems associated with use of pit toilets among secondary school students in Gokana local government area. The study provided answers to the following research questions:

1. What is the association of diarrhea with use of pit toilets among secondary school students in Gokana Local Government Area?
2. What is the association of dysentery with use of pit toilets among secondary school students in Gokana Local Government Area?

3. What is the association of cholera with use of pit toilets among secondary school students in Gokana Local Government Area?
4. What is the association of worm infection with use of pit toilets among secondary school students in Gokana Local Government Area?
5. What is the association of skin problem with use of pit toilets among secondary school students in Gokana Local Government Area?

Hypotheses

The following hypotheses were formulated and tested at 0.05 level of significance

1. There is no relationship between diarrhea and the use of pit toilets among secondary school students in Gokana local government area.
2. There is no relationship between dysentery and the use of pit toilets among secondary school students in Gokana local government area.
3. There is no relationship between cholera and the use of pit toilets among secondary school students in Gokana local government area.
4. There is no relationship between worm infection and the use of pit toilets among secondary school students in Gokana local government area.
5. There is no relationship between skin problem and the use of pit toilets among secondary school students in Gokana local government area.

Methodology

The research was conducted in Gokana LGA in Rivers State, the Niger Delta region of Nigeria. Rivers state is one of the 36 states in Nigeria located in the southern part of the country and bordered by the Atlantic Ocean. The study employed a descriptive cross sectional design. The population of the study consisted of all students in public schools in Gokana LGA, Rivers State, Nigeria. The sample size was calculated using Cochran formular (Cochran, 1963). A sample size of 400 was determined. The study adopted a systematic random sampling method to select every 5th student in the government secondary schools in Gokana LGA.

A structured questionnaire titled “Health Problems Associated with Use of Pit Toilet among Secondary School

Students in Gokana Local Government (HPAUGHTSSSGLG)” was used to get data from students. The questionnaire was used to elicit responses from 400 participants using close ended questions with options to choose the most appropriate response. The questionnaire consisted of 5 sections pit toilet use and diarrhea, dysentery, cholera, worm infection and skin problems. The section A collected data on socio-demographics. The Section B collected data on the health problems. The face and content validity “Health Problems Associated with Use of Pit Toilet among Secondary School Students in Gokana Local Government (HPAUGHTSSSGLG)” was determined by three experts. Each of the experts was given copies of the research questions, hypotheses and questionnaire as the instrument validation evaluation guide. Assessment, corrections, observations and inputs of the experts were effected in the instruments by the researcher to produce the final version of the instruments before administration to the target population for data collection for this study.

Reliability was tested using the cronbach alpha method, the validated questionnaire was administered to thirty (30) cassava processors in Emohua, which were not part of the population for the study. The Cronbach’s alpha was 0.88 (95% CI: 0.86–0.91), indicating that the questionnaire had good internal consistency. Data was collected using an interviewer-administered structured close ended questionnaire. The researcher obtained a letter of introduction from the Head of Department of Health and Safety Education, Ignatius Ajuru University of Education, Rumuolumeni, Port Harcourt, which was delivered to the chief medical officer asking for permission to conduct the study. The questionnaire was administered with the help of two trained research assistants.

The raw data collected was coded in a spreadsheet for easy analysis; it was then transferred to Statistical Products for Service Solutions (SPSS) version 27. Data entered and coded in SPSS, was analyzed and presented using descriptive statistics of percentages to answer the research question, while Chi-square was employed to test the hypotheses at 0.05 level of significance.

Results

Table 1: Association between diarrhea and the use of pit toilets among secondary school students in Gokana LGA

Diarrhea	Use of Pit Toilet		Total
	No F(%)	Yes F(%)	
Yes	72(78.3)	20(21.7)	92(100)
No	52(17.1)	252(82.9)	304(100)
Total	124(31.3)	272(68.7)	396(100)

Table 1 presents the association between diarrhea and the use of pit toilets among secondary school students in Gokana LGA. The table showed that 78.3% of those who had diarrhea did not use pit toilet and only 21.7% of the respondents who had diarrhea used pit toilet.

Table 2: Association between dysentery and the use of pit toilets among secondary school students in Gokana LGA

Dysentery	Use of Pit Toilet		Total
	No	Yes	
	F(%)	F(%)	
Yes	72(62.1)	44(37.9)	116(100)
No	52(18.6)	228(81.4)	280(100)
Total	124(31.3)	272(68.7)	396(100)

Table 2 presents the association between dysentery and the use of pit toilets among secondary school students in Gokana LGA. The table showed that 62.1% of those who had dysentery did not use pit toilet and only 37.9% of the respondents who had dysentery used pit toilet.

Table 3: Association between cholera and the use of pit toilets among secondary school students in Gokana LGA

Cholera	Use of Pit Toilet		Total
	No	Yes	
	F(%)	F(%)	
Yes	60(71.4)	24(28.6)	84(100)
No	64(20.5)	248(79.5)	312(100)
Total	124(31.3)	272(68.7)	396(100)

Table 3 presents the association between cholera and the use of pit toilets among secondary school students in Gokana LGA. The table showed that 71.4% of those who had cholera did not use pit toilet and only 28.6% of the respondents who had cholera used pit toilet.

Table 4: Association between worm infection and the use of pit toilets among secondary school students in Gokana LGA

Worm infection	Use of Pit Toilet		Total
	No	Yes	
	F(%)	F(%)	
Never	24(18.2)	108(81.8)	132(100)
Sometimes	72(58.1)	52(41.9)	124(100)
Always	28(20.0)	112(80.0)	140(100)
Total	124(31.3)	272(68.7)	396(100)

Table 4 presents the association between worm infection and the use of pit toilets among secondary school students in Gokana LGA. The table showed that 81.8% of those who had worm infection did not use pit toilet, 41.9% of those who had worm infection used pit toilet sometimes, and only 80.0% of the respondents who had worm infection used pit toilet.

Table 5: Association between skin problem and the use of pit toilets among secondary school students in Gokana LGA

Skin problem	Use of Pit Toilet		Total
	No	Yes	
	F(%)	F(%)	

Yes	24(18.2)	108(81.8)	132(100)
No	72(58.1)	52(41.9)	124(100)
Total	124(31.3)	272(68.7)	396(100)

Table 5 presents the association between skin problem and the use of pit toilets among secondary school students in Gokana LGA. The table showed that 81.8% of those who had skin problem did not use pit toilet and only 41.9% of the respondents who had skin problem used pit toilet.

Test of Hypotheses

Hypothesis One: There is no significant association between diarrhea and the use of pit toilets among secondary school students in Gokana LGA.

Table 6: Chi-square test showing association between diarrhea and the use of pit toilets among secondary school students in Gokana LGA

Diarrhea	Use of Pit Toilet		Total	df	χ^2	p-value	Decision
	No F(%)	Yes F(%)					
Yes	72(78.3)	20(21.7)	92(100)	1	122.81	0.00*	H ₀ rejected
No	52(17.1)	252(82.9)	304(100)				
Total	124(31.3)	272(68.7)	396(100)				

*Significant, p<0.05

Table 6 showed the Chi-square test of association between diarrhea and the use of pit toilets among secondary school students in Gokana LGA. The result showed that there was a statistically significant association between diarrhea and use of pit toilets as p<0.05 (X^2 -value = 122.81, df = 1, p = 0.00). Thus, the null hypothesis which stated that there is no significant association between diarrhea and the use of pit toilets among secondary school students in Gokana LGA was rejected.

Hypothesis Two: There is no significant association between dysentery and the use of pit toilets among secondary school students in Gokana LGA.

Table 7: Chi-square test showing association between dysentery and the use of pit toilets among secondary school students in Gokana LGA

Dysentery	Use of Pit Toilet		Total	df	χ^2	p-value	Decision
	No F(%)	Yes F(%)					
Yes	72(62.1)	44(37.9)	116(100)	1	72.15	0.00*	H ₀ rejected
No	52(18.6)	228(81.4)	280(100)				
Total	124(31.3)	272(68.7)	396(100)				

*Significant, p<0.05

Table 7 showed the Chi-square test of association between dysentery and the use of pit toilets among secondary school students in Gokana LGA. The result showed that there was a statistically significant association between dysentery and use of pit toilets as p<0.05 (X^2 -value = 72.15, df = 1, p = 0.00). Thus, the null hypothesis which stated that there is no significant association between dysentery and the use of pit toilets among secondary school students in Gokana LGA was rejected.

Hypothesis Three: There is no significant association between cholera and the use of pit toilets among secondary school students in Gokana LGA.

Table 8: Chi-square test showing association between cholera and the use of pit toilets among secondary school students in Gokana LGA

Cholera	Use of Pit Toilet		Total	df	χ^2	p-value	Decision
	No	Yes					
	F(%)	F(%)					
Yes	60(71.4)	24(28.6)	84(100)	1	79.77	0.00*	H ₀ rejected
No	64(20.5)	248(79.5)	312(100)				
Total	124(31.3)	272(68.7)	396(100)				

*Significant, p<0.05

Table 8 showed the Chi-square test of association between cholera and the use of pit toilets among secondary school students in Gokana LGA. The result showed that there was a statistically significant association between cholera and use of pit toilets as p<0.05 (X^2 -value = 79.77, df = 1, p = 0.00). Thus, the null hypothesis which stated that there is no significant association between cholera and the use of pit toilets among secondary school students in Gokana LGA was rejected.

Hypothesis Four: There is no significant association between worm infection and the use of pit toilets among secondary school students in Gokana LGA.

Table 9: Chi-square test showing association between worm infection and the use of pit toilets among secondary school students in Gokana LGA

Worm infection	Use of Pit Toilet		Total	df	χ^2	p-value	Decision
	No	Yes					
	F(%)	F(%)					
Never	24(18.2)	108(81.8)	132(100)	1	60.17	0.00*	H ₀ rejected
Sometimes	72(58.1)	52(41.9)	124(100)				
Always	28(20.0)	112(80.0)	140(100)				
Total	124(31.3)	272(68.7)	396(100)				

*Significant, p<0.05

Table 9 showed the Chi-square test of association between worm infection and the use of pit toilets among secondary school students in Gokana LGA. The result showed that there was a statistically significant association between worm infection and use of pit toilets as p<0.05 (X^2 -value = 60.17, df = 1, p = 0.00). Thus, the null hypothesis which stated that there is no significant association between worm infection and the use of pit toilets among secondary school students in Gokana LGA was rejected.

Hypothesis Five: There is no significant association between skin problem and the use of pit toilets among secondary school students in Gokana LGA.

Table 10: Chi-square test showing association between skin problem and the use of pit toilets among secondary school students in Gokana LGA

Skin problem	Use of Pit Toilet		Total	df	χ^2	p-value	Decision
	No	Yes					
	F(%)	F(%)					
Yes	24(18.2)	108(81.8)	132(100)	1	61.95	0.00*	H ₀ rejected
No	72(58.1)	52(41.9)	124(100)				
Total	124(31.3)	272(68.7)	396(100)				

*Significant, p<0.05

Table 10 showed the Chi-square test of association between skin problem and the use of pit toilets among secondary school students in Gokana LGA. The result showed that there was a statistically significant association between skin problem and use of pit toilets as $p < 0.05$ (X^2 -value = 61.95, $df = 1$, $p = 0.00$). Thus, the null hypothesis which stated that there is no significant association between skin problem and the use of pit toilets among secondary school students in Gokana LGA was rejected.

Discussion

The result showed that there was a statistically significant association between diarrhea and use of pit toilets. The finding of this study is in line with that of Cha et al. (2024) study in Ethiopia which showed an association between diarrhea and use of pit toilets. The finding of this study is in line with that of Owino Gudda et al. (2019) study in Kenya which showed an association between diarrhea and use of pit toilets. The finding of this study is in line with that of Ejeta et al. (2023) study in Africa which showed an association between diarrhea and use of pit toilets. The finding of this study is in line with that of Mabvouna et al. (2023) study in Douala which showed an association between diarrhea and use of pit toilets. The finding of this study is in line with that of Amadi et al. (2021) study in Nigeria which showed an association between diarrhea and use of pit toilets. This similarity found between the previous studies and the present one could be due to the homogeneity of the study respondents.

The result showed that there was a statistically significant association between dysentery and use of pit toilets. The finding of this study is in line with that of Cain et al. (2017) study in Bangladesh which showed an association between dysentery and use of pit toilets. The finding of this study is in line with that of DjoboCai et al. (2017) study in Kenya which showed an association between dysentery and use of pit toilets. The finding of this study is in line with that of Kotloff et al. (2023) study in Africa which showed an association between dysentery and use of pit toilets. The finding of this study is in line with that of Mabvouna et al. (2023) study in Douala which showed an association between dysentery and use of pit toilets. The finding of this study is in line with that of Katumbi et al. (2019) study in Zambia which showed an association between dysentery and use of pit toilets. This similarity found between the previous studies and the present one could be due to the homogeneity of the study respondents.

The result showed that there was a statistically significant association between cholera and use of pit toilets. The result showed that there was a statistically significant association between cholera and use of pit toilets. The finding of this study is in line with that of Abdi et al. (2022) study in

Ethiopia which showed an association between cholera and use of pit toilets. The finding of this study is in line with that of Katumba et al. (2019) study in Kenya which showed an association between cholera and use of pit toilets. The finding of this study is in line with that of Kotloff et al. (2023) study in Africa which showed an association between cholera and use of pit toilets. The finding of this study is in line with that of Adebayo et al. (2021) study in Lagos which showed an association between cholera and use of pit toilets. The finding of this study is in line with that of Katumbi et al. (2019) study in Zambia which showed an association between cholera and use of pit toilets. This similarity found between the previous studies and the present one could be due to the homogeneity of the study respondents.

The result showed that there was a statistically significant association between worm infection and use of pit toilets. The result showed that there was a statistically significant association between worm infection and use of pit toilets. The result showed that there was a statistically significant association between worm infection and use of pit toilets. The finding of this study is in line with that of Ezeamama et al. (2022) study in Ebonyi which showed an association between worm infection and use of pit toilets. The finding of this study is in line with that of Anunobi et al. (2019) study in Kogi which showed an association between worm infection and use of pit toilets. The finding of this study is in line with that of Strunz et al. (2015) study in Africa which showed an association between worm infection and use of pit toilets. The finding of this study is in line with that of Adebayo et al. (2021) study in Lagos which showed an association between worm infection and use of pit toilets. The finding of this study is in line with that of Manthrithilake et al. (2020) study in South Africa which showed an association between worm infection and use of pit toilets. This similarity found between the previous studies and the present one could be due to the homogeneity of the study respondents.

The result showed that there was a statistically significant association between skin problem and use of pit toilets. The result showed that there was a statistically significant association between skin infection and use of pit toilets. The result showed that there was a statistically significant association between skin infection and use of pit toilets. The result showed that there was a statistically significant association between skin infection and use of pit toilets. The finding of this study is in line with that of Heukelbach et al. (2017) study in Nigeria which showed an association between skin infection and use of pit toilets. The finding of this study is in line with that of Anunobi et al. (2019) study which showed an association between skin infection and use of pit toilets. The finding of this study is in line with

that of Zewude et al. (2024) study in Ethiopia which showed an association between skin infection and use of pit toilets. The finding of this study is in line with that of Adebayo et al. (2021) study in Lagos which showed an association between skin infection and use of pit toilets. The finding of this study is in line with that of Msiwa and Ntshalintshali (2019) study in South Africa which showed an association between skin infection and use of pit toilets. This similarity found between the previous studies and the present one could be due to the homogeneity of the study respondents.

Conclusion

Based on the findings of the study, it was concluded that, the health problems associated with use of pit toilets among secondary school students in Gokana Local Government Area, Rivers State were diarrhea, dysentery, cholera, worm infection, and skin problem.

Recommendations

Based on the findings of the study, the following recommendations were made:

1. The government should provide resources for the expansion of accessible, clean sanitation with accompanying health education and targeted outreach for vulnerable school populations.
2. The community stakeholders should reinforce the importance of integrating sanitation infrastructure upgrades into worm control programs by working in collaboration with the community healthcare workers.
3. The social welfare agency should couple latrine upgrades with behaviour-change campaigns and regular deworming programs, to achieve sustainable control of worm infections.
4. The Community Development Committee in collaboration with the government should resources for infrastructural reinforcement and location of latrines in the different communities.
5. The authority should integrate WASH and dermato-epidemiological interventions in secondary schools and communities to curb skin infection.

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