

Factors Associated with Diarrhea Diseases among the Boarding Secondary School Students of Rulindo District, Rwanda

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Abstract

Diarrheal diseases remain a significant public health concern among school-aged children, particularly in boarding schools where communal living conditions may facilitate disease transmission. This study assessed factors associated with diarrheal diseases among boarding secondary school students at GS APAPEC Murambi in Rulindo District, Rwanda. Specifically, the study examined the prevalence of diarrheal diseases, contributing factors, effects on students' academic and psychosocial well-being, and existing prevention and management strategies. A cross-sectional descriptive and analytical study design employing mixed methods was used. Qualitative data were collected from seven school staff using structured questionnaires, while quantitative data were obtained from 174 students. Observation was also conducted to assess water, sanitation, and hygiene (WASH) conditions. Data were analyzed using descriptive statistics, multivariate logistic regression, and thematic analysis. The findings revealed that diarrheal diseases were relatively uncommon but remained a recurring health concern, with 71.5% of respondents reporting either rare or occasional cases. Lower-level students (S1–S3) were significantly more vulnerable to diarrheal diseases than upper-level students (AOR = 2.31, $p = 0.044$). Significant factors associated with diarrheal disease vulnerability included inadequate handwashing with soap (AOR = 3.12, $p = 0.012$), water shortages during the dry season (AOR = 2.74, $p = 0.028$), limited access to safe drinking water (AOR = 2.58, $p = 0.026$), poor personal hygiene (AOR = 2.46, $p = 0.032$), and poor hygiene practices at home (AOR = 2.37, $p = 0.040$). Diarrheal diseases were associated with poor concentration, reduced attendance, emotional distress, stigma, and lower participation in extracurricular activities. Effective prevention strategies included referral of affected students to health facilities, school health policies, sanitation activities, and health education campaigns. The study concludes that sustained improvements in WASH infrastructure, hygiene promotion, water supply systems, and school health programs are essential for reducing diarrheal diseases and improving students' health, psychosocial well-being, and academic performance in boarding schools.

Keywords: Diarrhea diseases, Boarding school students, water, sanitation, hygiene

Introduction

Globally, diarrhea is still prevalent and persistent public health issue, disproportionately affecting children and students in developing countries. It contributes significantly to both morbidity and mortality, especially in rural settings which can not easily access the WASH services (1). Major risk factors include poor personal hygiene, inadequate sanitation facilities, unsafe drinking water, and consumption of

unhygienic snacks (2). Conversely, the presence of improved hygiene facilities, clean school canteens, and functional health services has been associated with substantial reductions in diarrheal incidence (3). Educational and behavioral factors also influence disease outcomes. Students who possess greater knowledge of hygiene practices, have positive attitudes toward prevention, and come from families with higher parental education levels tend to report fewer diarrheal episodes (4). Kihara emphasized that a comprehensive approach involving personal hygiene promotion, environmental sanitation, and health education is essential for long-term prevention (5). According to Liang the passing of three or more loose or watery stools each day for at least three days is the clinical definition of diarrhea. Other symptoms including vomiting, dehydration, and stomach discomfort may also be present. There are three types of diarrhea: acute, chronic, and traveler, each with distinct etiologies and implications. Acute diarrhea lasting less than 14 days is usually caused by pathogen microbes like bacteria, viruses, or parasites. Chronic diarrhea, often last for more than one month, often has non-infectious origins, while traveler's diarrhea results from consuming contaminated food or water during travel (6).

Similarly, several studies across Asia have identified poor sanitation, inadequate handwashing stations, and irregular toilet usage as major drivers of diarrheal infections among school-aged children (7,8). Research from China and Indonesia confirms that students in schools with limited hygiene infrastructure are more susceptible to diarrheal diseases, especially those in elementary schools (9). Therefore, increasing access to safe water, sufficient sanitary infrastructures, and education to hygiene continues to be a top global goal in order to lower school-age diarrhea-related morbidity and death.

Across sub-Saharan Africa, diarrhea continues to be one of the top causes of childhood morbidity and mortality. Epidemiological data reveal prevalence rates ranging from 13.1% to 24.8%, depending on region and population characteristics (10). Contributing factors include poverty, maternal education, and access to sanitation services. According to the World Health Organization (2024), there were about 1.01 billion cases of diarrhea and 515,031 deaths in 2020, with the highest burden among children under five years old. In some studies, prevalence peaked at 23.6% (1,11).

UNICEF reported 151.9 deaths per 100,000 in 2021, of children under five in sub-Sahara Africans illustrating the continued vulnerability of children in the region. Treatment coverage remains alarmingly low; only about 19% of affected children received the recommended oral rehydration salts and zinc supplements from UNICEF programs (12). These figures highlight persistent disparities in healthcare access and the urgent need for investment in WASH infrastructure and community-based education programs.

In some countries of the East African Community (EAC) including Rwanda, diarrhea disease continues is still a major public health concern, with prevalence rates similar to the sub-Saharan average of 13–25% (13). A study by Nyakairu (2025) estimated that diarrhea affects approximately 1.8 million people annually in Burundi, Rwanda, and Tanzania. Contributing risk factors include unimproved sanitation, low maternal education, poverty, and seasonal variations in rainfall that affect water availability (14).

In Uganda, rotavirus remains a persistent cause of childhood diarrhea due to incomplete vaccination coverage and delayed healthcare-seeking behavior (15). In Kenya, diarrheal prevalence is notably high among children introduced to complementary feeding, particularly in low-income urban neighborhoods (16). Meanwhile, Tanzania reports a prevalence of about 31.6% among children. Socioeconomic inequalities, poor sanitation, and rural residence all elevate the risk of infection (17). Addressing these challenges requires coordinated efforts focused on water quality improvement, sanitation infrastructure, hygiene education, and accessible healthcare services.

In Rwanda, similar to other East African countries, diarrhea is a serious public health concern particularly among boarding school students and children under five. Poor sanitation, limited hygiene practices, and restricted access to clean water are key determinants of disease occurrence (18). Environmental factors such as shared toilets, open defecation, and unsafe water sources exacerbate infection risks (19). Behavioral aspects, including infrequent handwashing and poor nail hygiene, also contribute significantly to transmission.

Interventions focusing on health education, hygiene promotion, and sanitation infrastructure improvements have demonstrated measurable success in reducing disease cases (20). Studies show that living in rural areas and using unimproved toilets are associated with higher risk (21). Research estimates diarrhea prevalence among Rwandan children between 12.7% and 26.7%, with higher rates observed among low-income households and certain geographic regions. The consequence of the diarrhea on economy is substantial households reportedly bear 65% of the total hospitalization costs.

Preventive measures such as rotavirus vaccination, community hygiene programs, and sanitation improvements have shown encouraging results. A health education and socialization initiative implemented in an Islamic boarding school, for example, significantly reduced diarrhea cases among students (22). These findings reinforce the importance of multi-sectoral interventions that integrate health, education, and environmental management to prevent diarrhea diseases.

In summary, diarrhea was identified as the important issue globally and children are more affected than other categories of people in developing countries. Although mortality rates have declined over the past three decades, the persistence of risk factors such as inadequate WASH infrastructure, low education levels, and limited healthcare access continues to drive high disease prevalence. Understanding the epidemiological trends of diarrhea from global statistics to national realities such as in Rwanda provides essential justification for this study. Addressing the problem requires a holistic strategy that combines public health education, improved infrastructure, vaccine expansion, and community-based interventions to ensure sustainable disease prevention and health equity.

Methods

Study design

This study used a cross-sectional study design combining quantitative and qualitative methods to assess diarrhea prevalence among boarding students, its associated factors, and impact on students. Quantitative data have assessed prevalence of diarrhea and its associated factors, while qualitative interviews and FGDs, and observations have explored experiences, consequences, and contextual factors. Overall, while cross-sectional analyses estimate prevalence and identify associated factors, qualitative insights deepen understanding of students lived experiences, contextual influences, and behavioral patterns. The mixed-methods approach thus allows not only measurement of disease burden but also exploration of its social, emotional, and educational consequences, providing a holistic view of diarrhea's impact in boarding school settings.

Target Population

This study targeted the students from G.S. APAPEC Murambi, particularly those in lower secondary levels (S1–S3), who are considered more vulnerable due to their young age and limited experience in boarding school settings. In addition, school staff were included as key informants, namely the head teacher, Director of studies, director of discipline (DoD), patron, and matron because of their close involvement in students' daily supervision and welfare.

Sample size and sampling procedure

The sample size for the quantitative data was 174 participants, with a total target population of 322 students were enrolled in S1, S2&S3 during 2025/2026 academic-year, including 67 from S1 (41 males and 26 females), 117 in S2 (46 males and 71 females) and 138 in S3 (71 males and 67 females). GS APAPEC Murambi, located in a rural area of Rulindo District, was purposively selected as the study site due to its vulnerability to diarrheal diseases. Purposive and random sampling were therefore employed to deliberately target students most relevant to the study objectives. This technique ensured that participants had direct experience of the boarding school environment and could provide rich insights into sanitation challenges, hygiene practices, and the impact of diarrheal diseases.

Data analysis and ethical consideration

Quantitative data was analyzed using SPSS through descriptive and inferential statistics, while qualitative data have been examined using thematic and narrative analysis. Thematic analysis, following Braun and Clarke's six-step framework, identifies and interprets meaning patterns in data. This rigorous approach enhances credibility and is widely applied in healthcare research for in-depth understanding. Before reaching the site, the researcher presented the clearance letter issued from MKU and introduced the research. She also ensured to obtain the authorization form from the district to conduct the research in the settings detailed in this document.

Participants have been assured of complete privacy, with data used solely for the study's purpose. Participants provided anonymous data identified only by confidential codes. No personal information has been disclosed in any form, ensuring privacy and preventing bias, thereby promoting honest, unbiased responses throughout communication between the researcher and participants.

Results

Demographic Details of Respondents

Demographic characteristics were analyzed to contextualize the findings and assess the representativeness of respondents. Both student and school staff were recorded and presented separately.

Table 1 Age of students as the main respondents (n=174 students)

Age	Boys	Girls	Total
12	12 (13.8%)	15 (17.2%)	27 (15.5%)
13	11 (12.6%)	19 (21.8%)	30 (17.2%)
14	22 (25.3%)	20 (23.0%)	42 (24.1%)
15	24 (27.6%)	16 (18.4%)	40 (23.0%)
Above 15	18 (20.7%)	17 (19.5%)	35 (20.1%)
Total	87 (100%)	87 (100%)	174 (100%)

The table above shows that the students surveyed are fairly evenly distributed across age groups, with the highest proportions aged 14 years (24%) and 15 years (23%). Students aged above 15 years account for 20%, while those aged 12 and 13 represent 16% and 17% respectively. No respondents were below 12 years. The sample is gender-balanced, with equal numbers of boys and girls (87 each), ensuring representativeness across age categories.

Table 2 Academic level of students

Level of education	Males n (%)	Females n (%)	Total n (%)
S1 students	23 (13.2%)	14 (8.0%)	37 (21.3%)
S2 students	25 (14.4%)	38 (21.8%)	63 (36.2%)
S3 students	39 (22.4%)	35 (20.1%)	74 (42.5%)
Total	87 (50.0%)	87 (50.0%)	174 (100%)

Source: (Primary data, 2026)

The table above shows that respondents were selected proportionally according to student enrolment in each academic level at G.S APAPEC Murambi, as presented in Table 1 of Chapter 3. Senior 3 students formed the largest group with 74 respondents (43%), followed by Senior 2 with 63 (36%) and Senior 1 with 37 (21%). The study also achieved equal gender representation, with 87 males and 87 females participating. This proportional distribution ensured balanced representation of students' experiences and perspectives across all academic levels.

4.2.2. Demographic details of staff as the key informants

Table 3 Position and gender of respondents

Position/Sex	Males n (%)	Females n (%)	Total n (%)
Administrative staff	2 (28.6%)	1 (14.3%)	3 (42.9%)
Boarding staff	1 (14.3%)	1 (14.3%)	2 (28.6%)
Others	1 (14.3%)	1 (14.3%)	2 (28.6%)
Total	4 (57.1%)	3 (42.9%)	7 (100%)

Source: (Primary data, 2026)

Table 3 indicates that seven school staff participated in the study, with a nearly balanced gender distribution of four males and three females. Respondents came from diverse functional roles, including administration (approximately 46%), boarding staff (39%), and teaching staff (15%), ensuring insights from policy, academic, and daily student supervision perspectives. Female staff, particularly matrons and boarding supervisors, were slightly more represented (57%), which is relevant according to their direct involvement in students' hygiene and health monitoring. This mix of roles and genders provided comprehensive and informed perspectives on school hygiene, sanitation practices, diarrhea prevalence, and institutional health responses, enhancing the study's reliability and relevance.

The prevalence of diarrhea diseases among the boarding secondary students in Rulindo District

To assess the prevalence of diarrheal diseases among boarding secondary school students in Rulindo District, data were collected on the frequency of diarrhea cases and perceptions of vulnerability across student groups. Understanding the occurrence of diarrhea and identifying the groups perceived to be at greater risk were essential for determining the extent of the problem within the boarding school environment. The analysis focused on the frequency of reported diarrhea cases during the two most recent school terms, differences in vulnerability between lower- and upper-level students, and perceived sex-specific susceptibility to diarrheal diseases.

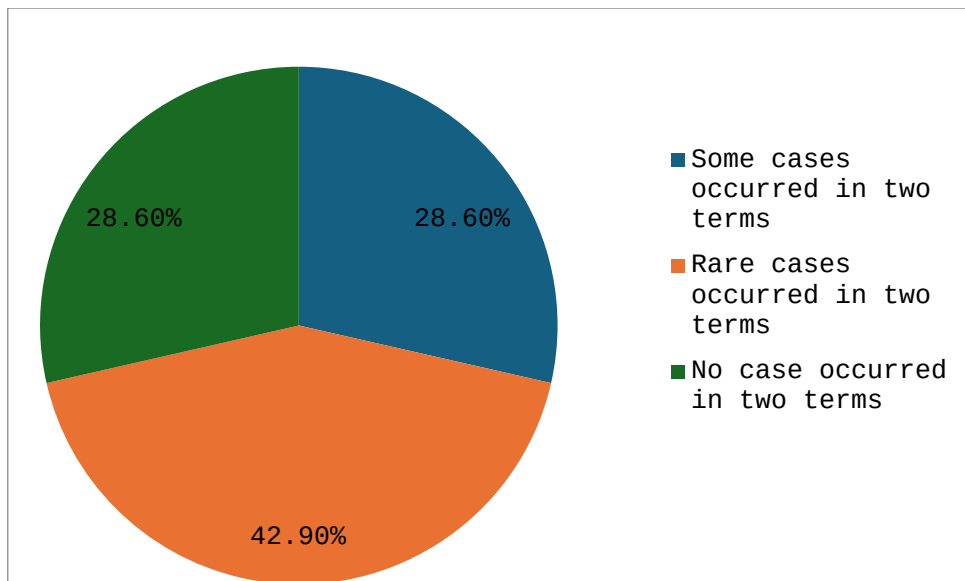


Figure 1: Overall prevalence of diarrhea during two terms

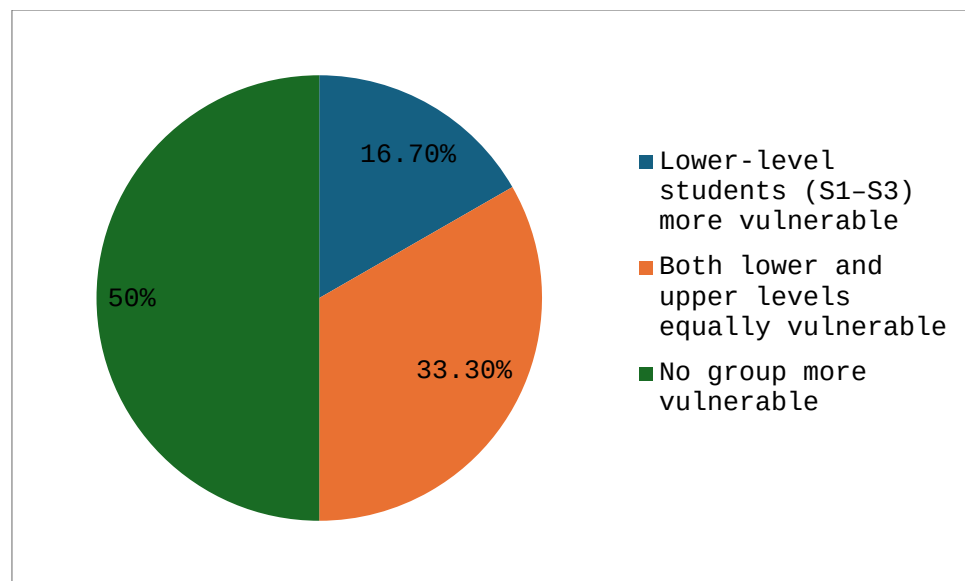


Figure 2: Prevalence by level of education

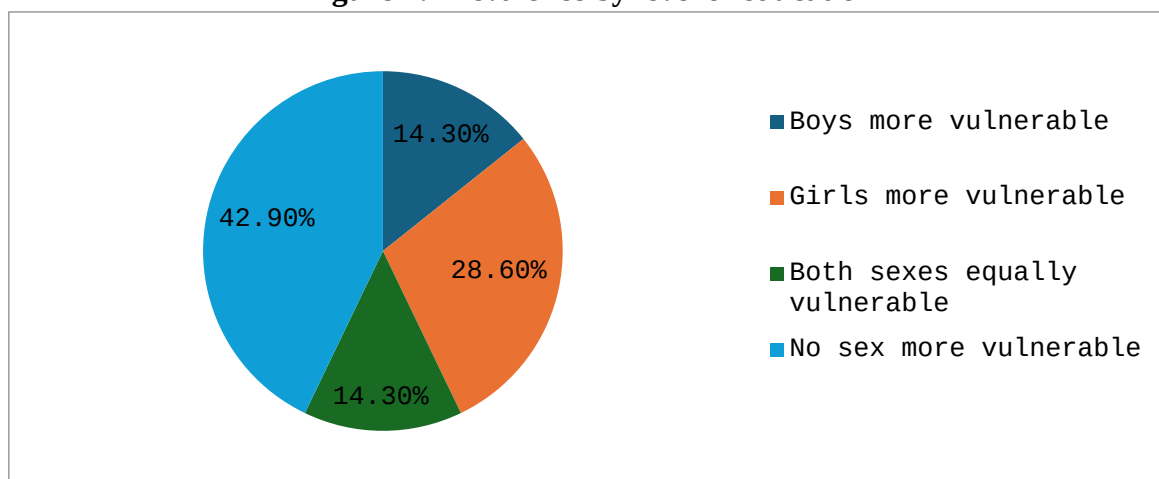


Figure 3: Prevalence of diarrhea by sex in two terms

The findings indicate that the prevalence of diarrheal diseases among boarding students was generally low during the two most recent school terms. Most staff respondents (42.9%) reported that diarrhea cases were rare, while 28.6% indicated that some cases occurred per term and another 28.6% reported no cases at all. These results suggest that although diarrhea was not widespread, occasional occurrences persisted within the school environment. Regarding vulnerability by academic level, half of the respondents (50.0%) believed that no particular student group was more susceptible to diarrhea, while 33.3% considered lower- and upper-level students equally vulnerable. Only 16.7% perceived lower-level students (S1–S3) as being at higher risk. Similarly, perceptions of vulnerability by sex showed that 42.9% of staff believed no sex was particularly at risk, whereas 28.6% considered girls more vulnerable than boys. Overall, the findings demonstrate a relatively low prevalence of diarrhea and suggest that vulnerability is generally perceived as evenly distributed across student groups, with only slight concerns regarding younger students and girls.

Key themes

Frequency of diarrhea cases, Perceived vulnerability to diarrheal diseases, Sex-specific vulnerability to diarrheal diseases, influencing factors (environmental, household, water availability and institutional factors).

The qualitative findings corroborated both the descriptive and regression results by confirming that diarrheal diseases existed within the school, although their occurrence was generally infrequent and mild. Students participating in FGDs consistently reported that only a small number of learners experienced diarrhea, particularly during the first term of the 2025/2026 academic year, and no major outbreaks were reported. These views are consistent with the statistical findings, where 42.9% of respondents indicated that diarrhea cases were rare and 28.6% reported only occasional cases. Students further explained that communal living conditions, shared sanitation facilities, and occasional lapses in hygiene practices contributed to the persistence of sporadic diarrhea cases. These accounts reinforce the importance of maintaining effective WASH interventions and routine health surveillance despite the low prevalence observed.

The qualitative findings also revealed that vulnerability to diarrheal diseases was influenced by adaptation challenges, individual hygiene behaviors, and seasonal conditions. Students perceived lower-level students as more susceptible because they often struggle to adjust to boarding school life, including communal sanitation facilities, dietary changes, and hygiene expectations. This perception aligns with the regression results, which identified lower-level students as having significantly higher odds of vulnerability. Participants further noted that boys were generally more likely to engage in risky hygiene and food-handling behaviors, whereas girls tended to be more cautious, although all students were exposed to similar environmental conditions. Students also reported that diarrhea cases were more common at the beginning of the academic year and during the dry season when water shortages increased reliance on stored water. These observations suggest that behavioral and environmental factors continue to sustain diarrhea risk even where prevalence remains relatively low.

Environmental challenges such as lack of pavement, poor drainage, and waste management issues were also commonly identified. Household influences included poor hygiene practices at home, unsafe food consumption outside school, and low community sanitation standards. The findings suggest that diarrhea disease vulnerability is not attributable to a single factor but rather results from the interaction of environmental sanitation deficiencies, inadequate hygiene behaviors, and challenges in accessing safe

water. These conditions create opportunities for disease transmission and contribute to the persistence of occasional diarrheal cases within the boarding school environment.

The qualitative findings strongly corroborated the quantitative results. Students repeatedly identified inadequate handwashing and water scarcity as major contributors to diarrheal diseases. Participants explained that during periods of water shortage, students occasionally prioritized water for drinking and cooking, reducing opportunities for handwashing and personal hygiene. Several students also reported that some learners failed to wash their hands before meals or after using toilets, particularly when soap was unavailable. These accounts support the statistical findings that highlighted handwashing practices and water shortages as key determinants of disease vulnerability.

The qualitative findings further revealed that environmental and behavioral factors interacted to increase diarrheal disease risks. Students reported that overcrowding in dining facilities sometimes led to poor cleaning of utensils and eating areas. Others noted that some students consumed food purchased outside the school without considering hygiene conditions. Participants also expressed concern regarding water stored in tanks during the dry season, indicating that cleaning and maintenance of storage facilities were not always consistent. These observations reinforce the view that diarrheal disease vulnerability is shaped by multiple interconnected environmental, institutional, and behavioral factors rather than by a single cause.

The qualitative findings corroborated the quantitative and regression results by demonstrating that diarrheal diseases negatively affect students' educational experiences and daily functioning. Key informants consistently reported that students suffering from diarrhea often experience weakness, fatigue, loss of appetite, and repeated toilet visits, which reduce concentration and classroom participation. Several respondents explained that affected students struggle to follow lessons effectively and may remain absent from school or spend extended periods resting in dormitories. These observations support the descriptive findings where 75.0% of respondents identified poor concentration as the most common academic consequence.

Focus group discussions further revealed that students frequently miss classes, examinations, and important learning activities due to illness, hospital visits, or physical discomfort. Students explained that severe stomach pain and the need for repeated toilet visits make it difficult to focus during lessons even when present in class. Participants also reported that diarrheal diseases limit participation in sports, clubs, and collective activities because affected students often remain in dormitories or avoid physical movement. These experiences support the regression findings that identified reduced attendance and severe reduction in extracurricular participation as significant consequences of diarrheal illness.

The qualitative findings additionally revealed substantial psycho-social consequences. Students explained that diarrheal diseases often cause embarrassment, anxiety, and reduced confidence, particularly when accidents occur or when peers notice repeated toilet visits. Some participants reported experiences of teasing and stigma that led affected students to withdraw from social interactions and group activities. Observational findings further showed that poor sanitation conditions, unpleasant toilet odors, inadequate handwashing facilities, and overcrowded dormitories may intensify these psycho-social challenges. These findings reinforce the statistical evidence showing that emotional distress, stigma, and social isolation are among the most significant consequences of diarrheal diseases among boarding school students.

Discussion.

The findings indicate that the prevalence of diarrheal diseases among boarding secondary school students

was generally low during the two most recent school terms. Descriptive findings showed that 42.9% of respondents reported rare cases of diarrhea, 28.6% reported some cases occurring per term, while 28.6% indicated that no cases had occurred. Although the prevalence appeared relatively low, the fact that 71.5% of respondents acknowledged the occurrence of at least some diarrheal cases demonstrates that the disease remains present within the school environment. These findings are consistent with global evidence suggesting that schools with basic WASH services often experience sporadic diarrheal episodes rather than large outbreaks. The relatively low prevalence observed may therefore reflect the presence of preventive measures that have reduced, but not completely eliminated, disease transmission.

The regression analysis provided additional insight into patterns of vulnerability. Lower-level students (S1–S3) were significantly more vulnerable to diarrheal diseases than upper-level students (AOR = 2.31, 95% CI: 1.02–5.24, $p = 0.044$). This finding suggests that younger students may experience greater challenges adapting to boarding school life, including shared sanitation facilities, communal dining systems, and personal hygiene requirements. Although sex-related differences were not statistically significant, girls showed slightly elevated odds of vulnerability compared with boys. The absence of strong sex-based differences suggests that exposure to environmental risk factors is relatively similar across the student population.

The qualitative findings provided important explanations for these statistical relationships. Students reported that lower-level learners often struggle to adjust to new hygiene expectations and communal living arrangements during their first years in boarding school. Participants explained that many younger students arrive from households with different sanitation practices and require time to adapt to institutional routines. Similar observations have been reported in previous studies showing that adaptation challenges contribute to increased susceptibility to communicable diseases among newly enrolled boarding students. These findings support the Health Promotion Model, which emphasizes that health behaviors are influenced by knowledge, experience, and environmental support systems.

The findings also revealed the influence of seasonal conditions on disease occurrence. Students reported that diarrheal cases were more common during periods of water scarcity, particularly at the beginning of academic terms and during the dry season. This observation highlights the interaction between environmental conditions and disease vulnerability and supports the Social Ecological Theory, which argues that health outcomes are shaped by individual, interpersonal, institutional, and environmental factors operating simultaneously. From a public health perspective, the persistence of occasional diarrheal cases despite relatively low prevalence suggests that continuous surveillance, hygiene promotion, and WASH improvements remain necessary. Therefore, the findings demonstrate that while the burden of diarrheal diseases is relatively low, important pockets of vulnerability remain among younger students and during periods of environmental stress.

The findings revealed that diarrheal disease vulnerability among boarding students was influenced by multiple environmental, institutional, household, behavioral, and water-related factors. Descriptive findings showed that inadequate handwashing with soap (42.9%) and water shortages during the dry season (42.9%) were the most frequently reported contributors to diarrheal diseases. Other important factors included poor hygiene practices at home, low community sanitation standards, unsafe food consumption outside school, poor drainage systems, and inadequate waste management. These findings indicate that diarrheal diseases result from the interaction of several determinants rather than from a single isolated risk factor.

The regression analysis strengthened this interpretation by identifying inadequate handwashing with soap as the strongest predictor of diarrheal disease vulnerability (AOR = 3.12, 95% CI: 1.28–7.62, $p = 0.012$). Water shortages during the dry season were also significantly associated with increased disease risk (AOR = 2.74, 95% CI: 1.11–6.75, $p = 0.028$). Additional significant predictors included poor personal hygiene (AOR = 2.46, $p = 0.032$), limited access to safe drinking water (AOR = 2.58, $p = 0.026$), and poor hygiene practices at home (AOR = 2.37, $p = 0.040$). These findings suggest that both behavioral and structural determinants play critical roles in disease transmission.

The findings strongly support the Social Ecological Theory, which explains health outcomes through the interaction of individual behaviors and environmental conditions. While students may understand the importance of handwashing, the effectiveness of such behaviors depends on access to water, soap, and appropriate sanitation facilities. Similarly, the findings support the Health Promotion Model by demonstrating that protective health behaviors alone are insufficient when environmental barriers limit their implementation. The significant association between water shortages and disease vulnerability highlights the importance of environmental infrastructure in supporting healthy behaviors.

Qualitative findings further reinforced the quantitative and regression results. Students consistently identified water scarcity as one of the major challenges affecting hygiene practices. During periods of limited water availability, priority was often given to drinking and cooking, leaving insufficient water for handwashing and personal hygiene. Participants also reported that some students occasionally consumed food from vendors outside the school without considering hygiene standards. These observations explain why water shortages and unsafe food consumption were associated with increased disease vulnerability. Observational findings revealed additional environmental risks, including inadequate handwashing facilities, poorly maintained sanitation areas, overcrowding, and waste management challenges. These findings correspond with previous studies conducted in Rwanda and other low- and middle-income countries, which have consistently identified water, sanitation, and hygiene deficiencies as major determinants of diarrheal diseases. The findings therefore demonstrate that effective disease prevention requires integrated interventions addressing both behavioral practices and environmental conditions. Focusing exclusively on health education without improving water supply and sanitation infrastructure is unlikely to produce sustainable reductions in disease occurrence.

The academic consequences observed in this study support Human Capital Theory, which emphasizes the importance of health for educational productivity and long-term human development. Students suffering from diarrheal diseases frequently miss classes, struggle to concentrate, and experience reduced participation in learning activities. These disruptions can negatively affect academic performance and educational attainment. Similar findings have been reported in studies showing that recurrent illness contributes to absenteeism, reduced cognitive functioning, and poor educational outcomes among school-aged children.

Qualitative findings provided valuable explanations for these relationships. Students explained that severe abdominal pain, weakness, dehydration, and repeated toilet visits make it difficult to concentrate during lessons. Some participants reported missing examinations or important classroom activities due to illness or medical appointments. Even when physically present in class, many students described difficulty focusing on lessons because of discomfort and anxiety. These accounts explain the strong association between diarrheal diseases and poor concentration observed in the regression analysis.

The findings also reveal important psycho-social consequences. Students reported experiencing embarrassment when frequent toilet visits attracted attention from peers. Others described feelings of

anxiety, isolation, and reduced self-confidence following episodes of illness. These findings support Stigma Theory, which argues that health-related conditions can lead to social labeling, exclusion, and diminished self-esteem. The significant association between emotional distress and diarrheal illness suggests that the disease should not be viewed solely as a medical problem but also as a psychosocial challenge requiring supportive interventions.

The reduction in extracurricular participation further highlights the broader impact of diarrheal diseases on student development. Sports, clubs, and social activities are important components of school life that contribute to teamwork, leadership skills, and emotional resilience. When illness limits participation in these activities, students lose opportunities for social interaction and personal growth. Therefore, addressing diarrheal diseases can generate benefits extending beyond health improvement to include educational achievement and psychosocial development.

Conclusion

The findings demonstrate that although diarrheal diseases are not highly prevalent, they remain an important public health concern because of their effects on students' health, educational participation, and psycho-social well-being. Age and academic level remain important considerations in school health interventions. The disease contributes to reduced attendance, poor concentration, emotional distress, stigma, social isolation, and lower participation in extracurricular activities. Therefore, effective prevention and control of diarrheal diseases in boarding schools require an integrated approach combining improved WASH infrastructure, continuous hygiene education, effective school health policies, routine disease surveillance, and active participation of students, school authorities, health facilities, and local government institutions.

Recommendation

Based on the findings and conclusions of this study, the researcher proposes the following recommendations to strengthen the prevention and management of diarrheal diseases among boarding secondary school students. These recommendations target key actors involved in school health promotion, including school administration, students, local government authorities, and national policymakers. 1, Improve access to safe drinking water by installing water treatment systems, strengthening water storage capacity, or ensuring a regular supply of treated water within the school compound. 2, Strengthen collaboration between schools, health centers, and local government institutions to improve school health services and rapid response to disease outbreaks. 3, Develop monitoring and inspection mechanisms to ensure compliance with national sanitation and school health standards.

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