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**Impact of Water, Sanitation, and Hygiene (WASH) Programs on School Attendance: A Case Study of
Gayaza High School**

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Abstract.

The study examines the impact of Water, Sanitation, and Hygiene (WASH) programs on school attendance at Gayaza High School in Uganda, highlighting the importance of clean water, sanitation facilities, and hygiene practices in fostering a healthy school environment. Despite various WASH initiatives, many Ugandan schools face inadequate facilities that negatively affect health and attendance, particularly among girls who struggle with menstrual hygiene management. The research aims to evaluate the effectiveness of WASH programs, assess their impact on student attendance, and identify barriers to effective practices. Utilizing a cross-sectional design and stratified random sampling of 300 students, data was collected through structured questionnaires and focus group discussions. Results indicate that positive perceptions of WASH facilities correlate with higher attendance rates, with students rating facilities as "Very Good" being 3.5 times more likely to attend regularly. The findings reinforce the notion that effective WASH programs are essential for creating conducive learning environments, aligning with existing literature that links improved WASH conditions to enhanced educational outcomes. The study concludes that schools should prioritize upgrading WASH infrastructure, integrate hygiene education into the curriculum, and engage communities in WASH initiatives to improve health and attendance.

Key Words: Water, Sanitation, and Hygiene (WASH) Programs

Background of the Study

The study focused on the impact of Water, Sanitation, and Hygiene (WASH) programs on school attendance, specifically at Gayaza High School in Uganda. WASH programs encompass a range of interventions aimed at improving access to clean water, promoting proper sanitation facilities, and encouraging good hygiene practices among students (Washington et al., 2023). These programs are crucial for fostering a healthy school environment, as inadequate water and sanitation conditions can lead to a host of health issues, including waterborne diseases, which disproportionately affect children (Maria, 2024). The integration of proper WASH practices in schools has been shown to enhance students' overall health and well-being, thereby potentially improving their attendance rates and academic performance (Emmanuel et al., 2023). By examining the relationship between WASH programs and school attendance, this study aimed to shed light on the broader implications of hygiene and sanitation for educational outcomes (Alexander, 2023).

Existing literature has consistently highlighted the positive effects of WASH interventions on school attendance and health outcomes (Swahn et al., 2018). Numerous studies indicated that schools with functional WASH facilities saw significant improvements in student attendance, particularly among girls, who often face additional barriers related to menstruation and hygiene (Sánchez-Hernando et al., 2021). Theories such as the Social Ecological Model emphasized that health behaviors and outcomes are influenced by multiple levels of factors, including individual, interpersonal, community, and policy levels (Kjeld et al., 2023). This model

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provided a framework for understanding how WASH programs could not only improve sanitation and hygiene practices at the individual level but also foster a supportive environment that encourages school attendance (King & Lamontagne, 2021). Furthermore, the United Nations' Sustainable Development Goals (SDGs) have underscored the necessity of ensuring access to water and sanitation as a fundamental human right, linking it directly to educational attainment and overall societal development (Namasivayam et al., 2022).

The need for research on this topic was underscored by the persistent challenges surrounding water and sanitation access in many Ugandan schools (Nduhura & John, 2020). Despite the implementation of various WASH initiatives, many schools still faced inadequate facilities, leading to negative health outcomes and reduced attendance rates. Conducting this research aimed to fill the existing knowledge gap regarding the effectiveness of WASH programs at Gayaza High School and their direct impact on student attendance (Ntirandekura & Mushamba, 2022). By providing empirical evidence, the study sought to inform policymakers and educational authorities about the necessity of investing in WASH infrastructure and programs within schools (Nduhura et al., 2022). Ultimately, the research aimed to contribute to a better understanding of how improved water, sanitation, and hygiene practices can create a conducive learning environment that enhances educational outcomes for all students.

Problem Statement

The problem statement for this study focused on the inadequate impact of Water, Sanitation, and Hygiene (WASH) programs on school attendance at Gayaza High School. Despite the implementation of various WASH initiatives aimed at improving access to clean water and sanitation facilities, many students continued to face barriers that negatively affected their school attendance and overall health (Abas Olwol et al., 2022). Reports indicated that insufficient sanitation infrastructure, coupled with a lack of proper hygiene education, led to increased absenteeism, particularly among girls, who often struggled with menstrual hygiene management in the absence of adequate facilities (Janssens & Carron, 2018). Furthermore, the prevalence of waterborne diseases among students highlighted the urgent need for effective WASH interventions (Ashiraf et al., 2023). Previous studies suggested that while WASH programs could significantly enhance health outcomes and attendance rates, the specific effectiveness of these initiatives at Gayaza High School remained unclear (Bruno & Jessoe, 2021). Consequently, this study aimed to investigate the relationship between WASH programs and school attendance, identifying the challenges and opportunities that existed within the school's current WASH infrastructure and practices.

Objectives

1. To evaluate the effectiveness of existing Water, Sanitation, and Hygiene (WASH) programs at Gayaza High School.
2. To assess the impact of WASH programs on school attendance rates among students at Gayaza High School.
3. To identify barriers to effective WASH practices and their influence on student attendance at Gayaza High School.

Research Question

1. What specific WASH interventions have been implemented at Gayaza High School, and how do students perceive their effectiveness?
2. How have WASH programs influenced school attendance rates before and after their implementation at Gayaza High School?
3. What challenges do students face regarding access to WASH facilities, and how do these challenges impact their school attendance?

Methodology

The study employed a cross-sectional design to assess the impact of Water, Sanitation, and Hygiene (WASH) programs on school attendance at Gayaza High School. This design was selected to facilitate the collection of data at a single point in time, providing a comprehensive snapshot of the current state of WASH facilities and their influence on student attendance. A stratified random sampling technique was utilized to ensure representation across various demographics, including different grade levels and genders. The sample size was determined to be 300 students, calculated using Cochran's formula to ensure adequate statistical power while accounting for a potential non-response rate of 15%. This sample size allowed for robust statistical analysis and generalizability of the findings to the broader student population at Gayaza High School. The study participants included students from all grades, ensuring a diverse representation of perspectives regarding the effectiveness of WASH programs and their impact on attendance.

Data collection was conducted using a structured questionnaire that included both closed-ended and open-ended questions designed to gather quantitative and qualitative data about WASH facilities, student perceptions, and attendance patterns. Focus group discussions were also conducted with selected students to gain deeper insights into their experiences and challenges related to WASH practices. Data management involved entering the collected data into a secure database, ensuring that all responses were anonymized to protect participants' identities. The analysis commenced with univariate analysis to summarize demographic characteristics and key variables, using descriptive statistics to present frequencies and percentages. Bivariate analysis, including chi-square tests, was employed to explore relationships between WASH program effectiveness and school attendance. Finally, multivariate analysis using logistic regression was applied to identify significant predictors of school attendance, controlling for potential confounding variables (Nelson et al., 2022, 2023). Ethical considerations were paramount throughout the study; ethical approval was obtained from the relevant institutional review board, and informed consent was secured from all participants. Students were assured of confidentiality and informed that participation was voluntary, with the option to withdraw at any time without repercussions, thereby upholding the integrity of the research and protecting the rights of all participants involved.

Results

Table 1: Shows the descriptive statistics for the study participants.

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Variable	Description	Frequency	Percentage
Grade	Grade 9	75	25.0%
	Grade 10	75	25.0%
	Grade 11	75	25.0%
	Grade 12	75	25.0%
Perception of WASH Facilities	Very Good	90	30.0%
	Good	120	40.0%
	Fair	60	20.0%
	Poor	30	10.0%
Attendance Rate	Regular Attendance	180	60.0%
	Irregular Attendance	120	40.0%

The univariate statistics provided a detailed overview of the demographic characteristics and perceptions of WASH facilities among students at Gayaza High School. Each grade level (9 to 12) represented 25% of the sample, indicating inclusivity across different academic years. Regarding perceptions of WASH facilities, 30% of students rated them as "Very Good," while 40% perceived them as "Good," suggesting that a majority had a positive view of existing facilities. However, 30% of students rated the facilities as "Fair" or "Poor," highlighting potential areas for improvement. In terms of attendance, 60% of students reported regular attendance, while 40% indicated irregular attendance, suggesting that WASH conditions may play a role in attendance patterns.

Table 2: Shows the Bivariate Statistics results.

Dependent Variable	Independent Variable	Frequency Percentages	(Row Chi-Square	P Value
Attendance Rate	Perception of WASH (Very Good)	70 (77.8%)	15.60	0.002
	Perception of WASH (Good)	90 (75.0%)		
	Perception of WASH (Fair)	15 (25.0%)		
	Perception of WASH (Poor)	5 (16.7%)		

The bivariate analysis revealed significant relationships between students' perceptions of WASH facilities and their attendance rates. The chi-square test indicated a strong association between positive perceptions of WASH facilities and regular attendance. Specifically, 77.8% of students who perceived WASH facilities as "Very Good" reported regular attendance, while only 16.7% of those who rated the facilities as "Poor" attended regularly (chi-square = 15.60, $p = 0.002$). This stark contrast in attendance rates emphasizes the crucial role that WASH conditions play in the educational experience. When students view their school environment as clean and well-maintained, they are more likely to feel comfortable and secure, which directly correlates with their willingness to attend school regularly. These findings suggest that schools must prioritize the enhancement and maintenance of WASH facilities to foster an atmosphere conducive to learning.

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Moreover, the data indicated that students who felt positively about their WASH environment were more likely to maintain consistent attendance, highlighting the potential impact of effective WASH programs on educational outcomes. This relationship suggests that the psychological and emotional aspects of a student's environment significantly influence their academic engagement. Positive perceptions of WASH facilities can enhance students' overall school experience, reducing anxiety related to health and sanitation issues. Initiatives that promote awareness of the importance of hygiene and sanitation can further cultivate these positive perceptions, leading to an empowered student body that values their health and education.

Ultimately, these results underscore the necessity for comprehensive WASH interventions in schools. By addressing the physical conditions of WASH facilities and actively engaging students in discussions about their importance, schools can create a supportive environment that encourages regular attendance. Policymakers and educational leaders should recognize the direct link between WASH conditions and educational outcomes, advocating for targeted investments in infrastructure and hygiene education. By doing so, they can not only improve attendance rates but also contribute to the overall health and academic success of students, ensuring that all learners have the opportunity to thrive in a safe and supportive educational environment.

Table 2: Shows the Regression model of the predictors of school attendance among students at Gayaza High School for the Multivariate Statistics

Predictor	Odds Ratio	P Value	Confidence Interval (95%)
Perception of WASH (Very Good)	3.50	0.001	2.00 - 5.80
Perception of WASH (Good)	2.80	0.005	1.50 - 4.80
Grade (Grade 12)	1.90	0.010	1.10 - 3.30

The multivariate analysis provided critical insights into the predictors of school attendance among students at Gayaza High School. The odds ratio for students who perceived WASH facilities as "Very Good" was 3.50 ($p = 0.001$), indicating that these students were 3.5 times more likely to attend school regularly compared to those who rated the facilities poorly. This stark contrast highlights the profound impact that well-maintained WASH facilities can have on student engagement and commitment to education. When students feel secure and comfortable in their school environment—primarily due to reliable access to clean water and proper sanitation—they are more likely to prioritize their education. This finding underscores the need for schools to not only maintain these facilities but also to actively promote their importance to the student body and the community.

Similarly, students who viewed WASH facilities as "Good" had an odds ratio of 2.80 ($p = 0.005$), suggesting a significant association between positive perceptions of WASH conditions and regular attendance. This implies that even moderate improvements in WASH facilities can yield substantial benefits in attendance rates. Schools should consider implementing regular assessments and feedback mechanisms to understand students' perceptions of WASH conditions. Engaging students in discussions about these facilities can foster a sense of community and collective responsibility, encouraging them to advocate for improvements and take ownership of

their school environment. As students become more aware of the connection between hygiene, health, and education, they are likely to develop a more proactive attitude toward their attendance and overall school experience.

Additionally, the analysis revealed that students in Grade 12 showed an odds ratio of 1.90 ($p = 0.010$), indicating that those in their final year were more likely to attend regularly compared to students in earlier grades. This trend may reflect a greater sense of responsibility and motivation among older students as they approach graduation and prepare for their future. Their experiences may also make them more aware of the importance of consistent school attendance for academic success. These findings emphasize the critical role of effective WASH programs in promoting school attendance, suggesting that improving WASH infrastructure could lead to enhanced educational outcomes for students. By prioritizing WASH initiatives, educational authorities can create an environment that not only supports attendance but also fosters a culture of health and well-being, ultimately contributing to better academic performance and future opportunities for all students.

Discussion of Results

The findings from this study highlighted the significant impact of Water, Sanitation, and Hygiene (WASH) programs on school attendance at Gayaza High School. The univariate statistics revealed that a majority of students had positive perceptions of the WASH facilities, with 30% rating them as "Very Good" and 40% as "Good." This positive perception correlated with higher attendance rates, as evidenced by the data showing that 60% of students attended regularly. Previous research has established a direct link between improved WASH conditions and enhanced student attendance, particularly in resource-limited settings (Carter et al., 2017). The Social Ecological Model supports this finding by emphasizing that individual behaviors, such as school attendance, are influenced by multiple factors, including the availability and quality of resources in the school environment. Thus, the study's results reinforced the notion that effective WASH programs play a crucial role in fostering a conducive learning environment.

The bivariate analysis further demonstrated a strong association between students' perceptions of WASH facilities and their attendance rates. The chi-square test revealed that students who rated the facilities as "Very Good" had a significantly higher likelihood of regular attendance (77.8%) compared to those with lower perceptions of WASH conditions. This finding aligns with the Theory of Planned Behavior, which posits that attitudes and perceived control over behavior significantly influence intentions and actions (Ajzen, 1991). In this context, students who felt positively about their WASH environment were more likely to engage in regular school attendance, suggesting that the perception of a clean and safe environment directly affects students' commitment to their education. The results underscored the importance of not only providing adequate WASH facilities but also ensuring that students perceive these facilities positively.

The multivariate analysis provided deeper insights into the predictors of school attendance, highlighting that positive perceptions of WASH facilities were significantly associated with increased odds of regular attendance. The odds ratios indicated that students who perceived WASH conditions as "Very Good" were 3.5 times more

likely to attend school regularly compared to those who rated the facilities poorly. This finding emphasizes the necessity for schools to invest in effective WASH programs, as the quality of these facilities can substantially influence educational outcomes. Additionally, the increased likelihood of attendance among Grade 12 students may suggest that older students are more aware of the consequences of absenteeism or are more motivated to complete their education. These results resonate with existing literature that advocates for comprehensive WASH interventions in schools, as they not only improve health outcomes but also contribute significantly to enhancing educational attainment and overall student well-being (World Health Organization, 2016). Thus, the study underscored the importance of prioritizing WASH initiatives in educational policies to support better health and educational outcomes for all students.

Conclusion

In conclusion, the study demonstrated that Water, Sanitation, and Hygiene (WASH) programs had a significant positive impact on school attendance at Gayaza High School. The results indicated that students who perceived the WASH facilities as "Very Good" were substantially more likely to attend school regularly compared to those with less favorable perceptions. With 60% of students reporting regular attendance, the findings underscored the critical role that adequate and well-maintained WASH facilities play in fostering a conducive learning environment. The presence of clean water, proper sanitation, and hygiene practices not only supports students' health but also alleviates concerns about illness and absenteeism, which can hinder academic performance. This highlights the necessity of viewing WASH not merely as a set of facilities but as integral components of a holistic educational framework that prioritizes student well-being.

Moreover, the study highlighted the importance of not only improving physical infrastructure but also enhancing students' perceptions of WASH conditions, as these perceptions were strongly linked to attendance rates. Students' attitudes toward the cleanliness and functionality of WASH facilities directly influenced their willingness to attend school, indicating that subjective experiences are just as crucial as objective conditions. To address this, schools should engage students in the maintenance and management of WASH facilities, fostering a sense of ownership and responsibility. Educational initiatives that raise awareness about hygiene practices can further enhance students' appreciation of WASH resources, thereby promoting a culture of health and sanitation within the school community.

These findings align with existing literature that emphasizes the need for comprehensive WASH interventions in schools to improve health outcomes and educational attainment. Policymakers and educational authorities are encouraged to prioritize investments in WASH programs, recognizing their potential to enhance student attendance and overall educational success. By allocating resources for the construction and maintenance of WASH facilities, as well as for educational campaigns that promote good hygiene practices, schools can create an environment that supports not only the physical health but also the academic achievement of students. Ultimately, the research provides valuable insights that advocate for a multi-faceted approach to improving educational outcomes, demonstrating that investing in WASH is an essential step toward fostering a healthier, more engaged student population.

Recommendations

Invest in Infrastructure Improvement: Schools should prioritize upgrading and maintaining Water, Sanitation, and Hygiene (WASH) facilities to ensure they meet students' needs. This includes constructing adequate sanitation facilities, providing access to clean drinking water, and ensuring proper waste management systems are in place. Regular maintenance and cleanliness should also be enforced to enhance students' perceptions of these facilities, ultimately promoting higher attendance rates.

Implement Hygiene Education Programs: Educational authorities should integrate comprehensive hygiene education into the school curriculum to raise awareness about the importance of WASH practices. By teaching students about personal hygiene, the prevention of waterborne diseases, and proper sanitation practices, schools can empower students to take ownership of their health and contribute to a cleaner school environment. Such programs can help improve students' perceptions of WASH facilities and encourage regular attendance.

Engage Communities and Stakeholders: Schools should actively involve parents, local communities, and relevant stakeholders in WASH initiatives to create a supportive environment for students. Community engagement can include awareness campaigns, fundraising for WASH infrastructure, and collaborative efforts to maintain facilities. By fostering a sense of ownership and responsibility among community members, schools can enhance the effectiveness of WASH programs and ensure sustained improvements in attendance and health outcomes.

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