https://journal.utripoli.edu.ly/index.php/Alqalam/index eISSN 2707-7179

Original article

Attitudes Toward Water, Sanitation, and Hygiene (WASH) Among Rural and Urban Students in Iringa Region, Tanzania

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ARTICLE INFO

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Received*: 02-10-2024*
Accepted*: 01-12-2024*
Published*: 04-12-2024*

Keywords*. Attitudes, Sanitation, Hygiene, WASH, Students, Tanzania*

ABSTRACT

Students' attitudes toward Water, Sanitation, and Hygiene (WASH) are influenced by socio-economic conditions, cultural perceptions, and resource availability. Urban students typically access better WASH facilities and education than rural peers. Cultural norms and community involvement play crucial roles in promoting positive hygiene practices and improving health outcomes, especially in Tanzania. The study examined WASH attitudes among students in rural and urban Iringa, Tanzania, highlighting socio-economic influences on these perspectives. This study assessed WASH attitudes among primary and secondary students in rural (Kilolo, Mufindi) and urban (Iringa Municipality) schools in Iringa, Tanzania, from July 4 to 25, 2024. A quantitative analytical cross-sectional design was employed, including 1,536 students randomly selected from 64 schools. Data were collected using structured questionnaires and analyzed by Statistical Package for Social Sciences (SPSS), utilizing descriptive statistics, P-values for associations, and multinomial logistic regression to identify predictors associated with attitudes among students. Rural students have a mean attitude score of 86.38%, slightly higher than urban students at 85.42%. The overall mean attitude score for both groups is 85.90%. It is noteworthy that both rural and urban settings demonstrate a high level of attitude. An independent samples t-test reveals a significant difference ($t = -2.067$, $p = 0.039$). In rural areas, 82.4% of students have a high attitude compared to 79.8% in urban areas. Key predictors of WASH attitudes include level of study and type of school, where primary and public-school students revealed significantly higher moderate attitudes, all with ($p < 0.05$). Rural students exhibit more positive WASH attitudes than urban peers, indicating the need for targeted educational programs and resources to address disparities in various settings highlighted attitude gaps.

Cite this article. *Magwe E. Attitudes Toward Water, Sanitation, and Hygiene (WASH) Among Rural and Urban Students in Iringa Region, Tanzania. Alq J Med App Sci. 2024;7(4):1447-1457. https://doi.org/10.54361/ajmas.247475*

INTRODUCTION

The attitudes toward Water, Sanitation, and Hygiene (WASH) among students in rural and urban settings are shaped by a multitude of factors, including socio-economic conditions, educational interventions, cultural perceptions, and the availability of resources [1]. The school environment serves as a critical platform for shaping students' attitudes toward WASH. Dakhode and Gaidhane highlighted that child spend a significant amount of time in school, where they are exposed to hygiene practices that can influence their attitudes and behaviors [2]. Moreover, Malingu's research indicates

that many schools that adopted hygiene education programs have successfully promoted positive attitudes toward sanitation and hygiene among students [3].

In urban settings, students often have better access to WASH facilities compared to their rural counterparts. Wada et al., found that urban students are more likely to engage in healthy WASH behaviors, which can be attributed to better infrastructure and educational resources [4]. This disparity is further substantiated by the findings of Berhanu et al., who reported that urban students are 3.5 times more likely to engage in proper handwashing practices due to improved attitudes when compared to their rural counterparts which indicates a distinct division influenced by geographical location [5]. The lack of adequate facilities in rural areas often leads to lower hygiene standards and increased susceptibility to waterborne diseases, which can adversely affect students' health and educational outcomes [2].

Cultural factors also play a significant role in shaping attitudes toward WASH. For instance, in some communities, cultural norms may discourage using modern sanitation facilities, leading to continued reliance on open defecation or inadequate hygiene practices [6]. In many communities, traditional beliefs and practices can either support or hinder the adoption of good hygiene practices [7]. Furthermore, the involvement of parents and community members in WASH programs can enhance the effectiveness of these initiatives, as community engagement is crucial for sustaining improvements in hygiene practices [8]. Moreover, the role of parents and community engagement cannot be overstated. Wada et al. emphasized that students learn not only from school-based initiatives but also from observing their parents' behaviors [4].

In Tanzania, cultural beliefs and practices also significantly influence WASH attitudes. Malima et al., identified that economic status, education level, and geographical location are key determinants of access to improved sanitation and hygiene facilities, which resulted in modified attitudes [9]. Further added that, in many communities, traditional practices might conflict with modern sanitation methods, leading to resistance to adopting new hygiene behaviors. Another Tanzanian study revealed that involving parents and community leaders in WASH education can help reinforce positive attitudes among students, as they often look to adults for guidance on hygiene practices [10]. Moreover, the impact of WASH attitudes on health outcomes is particularly pronounced in Tanzania, where inadequate sanitation and hygiene practices contribute to high rates of waterborne diseases [11]. This underscores the need for comprehensive strategies that not only educate students about hygiene but also improve infrastructure to support these practices.

This study assessed the attitudes toward Water, Sanitation, and Hygiene (WASH) among students in rural and urban educational settings within the Iringa Region of Tanzania and examined the predictors associated with attitudes. This study is of considerable importance as it tends to deepen the understanding of WASH attitudes among students across diverse socio-economic contexts. It also informs targeted interventions to improve WASH attitudes and contributes to policies that promote public health and educational outcomes in Tanzania.

METHODS

Area of study

This study was carried out in the districts of Iringa, Kilolo, and Mufindi, which form the Iringa region in Tanzania. The Iringa Region, located in the Southern Highlands zone of the Tanzania Mainland, is found south of the Equator, lying between the latitudes of 6° 55' and 9° 00' south and the longitudes of 33° 45' and 36° 55' East of Greenwich. It is bordered to the north by the regions of Singida and Dodoma, to the east by Morogoro, to the west by Mbeya, and to the south by the Njombe region [12]. Three districts were chosen for this research because of their varied economic conditions, geographical features, and differing population sizes. Iringa municipality, located in the Iringa district, was selected to symbolize urban schools due to its mainly urban character. On the other hand, Kilolo and Mufindi districts were chosen to represent schools in rural settings due to their mainly urban character. The Iringa district has 151 primary and 42 secondary schools, with 50 primary and 30 secondary schools situated within Iringa municipality. In contrast, the Kilolo district includes 133 primary and 44 secondary schools, whereas the Mufindi district has 162 primary and 48 secondary schools [13-16].

Study design

This study, conducted between July 4 and July 25, 2024, used a quantitative cross-sectional analytical method to evaluate WASH attitudes among students in rural and urban schools in the Iringa region of Tanzania.

Study population

This study included students from rural and urban schools in the Iringa region, encompassing public and private schools, as well as day and boarding options. The focus was on primary school students in standard 5 to 7, while those in the lower grades (standard 1 to 4) were not part of the study. For secondary education, the study accounted for both O-level students (form 1 to 4) and A-level students (form 5 to 6).

Sampling and sample size

A balanced number of rural and urban schools were purposefully chosen while ensuring a proportionate representation among both private and public institutions, as well as across primary and secondary schools and boarding and day schools. This stratification of rural and urban schools was established to facilitate a structured analysis. Specifically, 32 schools were selected from rural areas with equal representation from Kilolo and Mufindi, while another 32 schools were selected from Iringa Municipality to represent urban areas. This approach culminated in a total of 64 schools being part of the study. A simple random selection method was utilized to select schools from each category, alongside the selection of students from the selected schools.

The Cochran formula was then employed to calculate the sample size of students in the rural district of Kilolo. This determined size was also used for the second rural district, Mufindi. The overall sample size for the rural area was duplicated for the urban area.

Cochran formula: $N = \frac{Z^2P(1-P)}{d^2}$

Where;

N = Minimum sample size

Z = Constant, standard normal deviation (1.96 for 95% Confidence level)

P = Estimated proportion of the population (50% or 0.5) to maximize sample size in the absence of precise prevalence data

d = Acceptable margin of error (5% or 0.05)

For Kilolo district: $N = \frac{1.96^2 \times 0.5 \times (1-0.5)}{0.05^2} = 384$ students

The overall student count in rural schools hit 768, which was matched by an equal sample size of 768 students from urban schools, leading to a combined total of 1,536 students.

Data collection

Data were collected through structured questionnaires to evaluate WASH attitudes in rural and urban schools in Iringa, Tanzania.

Data analysis

Data analysis was performed utilizing version 26 of the Statistical Package for Social Sciences (SPSS), which incorporated both descriptive and comparative analyses to summarize and interpret the results. Frequencies and percentages associated with the WASH attitudes were computed. Significant relationships between variables were investigated using the P-value obtained from cross-tabulation, while predictors associated with attitudes were explored through multinomial logistic regression. The levels of attitudes were categorized into three groups: high attitudes (80% to 100%), moderate attitudes (60% to <80%), and poor attitudes (<60%).

Ethical considerations

Ruaha Catholic University (RUCU) issued ethical approval for this study, identified by reference number RU/RPC/RP/2024/14. Authorization to carry out the research was secured from the regional education officer's office, the relevant district education officers, and the school heads and administrators. All collected data were managed with utmost confidentiality, guaranteeing no personal information was disclosed.

RESULTS

Socio-demographic characteristics of rural-urban students in schools

The socio-demographic characteristics of the student population reveal intriguing insights. Among the 1,536 students surveyed, there are 543 (35.4%) students aged 10-12, and 533 (34.7%) students aged 13-15, indicating the age groups

with a significant number of participants. Regarding gender, females lead with 847 (55.1%) students, while males account for 689 (44.9%) students. Educational levels show that a significant number of 772 (50.3%) students are in primary school, and 690 (44.9%) students in O-level (form 1-4) secondary school. The distribution of students between urban and rural areas is equal, with 768 (50%) students in each category. Public schools dominate the education landscape, serving 1,017 (66.2%) students, indicating broader access to public education. When examining school districts, 768 (50%), students hail from Iringa, while both Kilolo and Mufindi have 384 students each (25%). Finally, living situations reveal that 1,074 (69.9%) students are day students, contrasting with 462 (30.1%) boarding students, as described in table 1.

Table 1. Demographic characteristics of students in schools (N = 1536)

Demographic Characteristics	Frequency (n)	Percent (%)
Age		
Under 10 years	70	4.6
10-12 years	543	35.4
13-15 years	533	34.7
16-18 years	338	22
Over 18 years	52	3.4
Gender		
Male	689	44.9
Female	847	55.1
Level of study		
Primary School (Standard 5-7)	772	50.3
Secondary school (Form 1-4)	690	44.9
High School (Form 5-6)	74	4.8
School Location		
Urban	768	50
Rural	768	50
Type of school		
Public	1017	66.2
Private	519	33.8
School district		
Iringa	768	50
Kilolo	384	25
Mufindi	384	25
Living situation		
Boarding student	462	30.1
Day student	1074	69.9

Water, sanitation, and Hygiene attitudes among students in schools

Notably, there is a strong consensus regarding the importance of good sanitation and hygiene practices reflecting positive attitudes. For instance, an overwhelming 96.4% of students either agreed (321, 20.9%) or strongly agreed (1159, 75.5%) that practicing good sanitation and hygiene is essential for their health. Additionally, 95.5% of respondents either agreed (236, 15.4%) or strongly agreed (1231, 80.1%) that clean and safe drinking water is critical for their educational environment. Furthermore, a remarkable 96.0% of students expressed their willingness to participate in hygiene promotion activities, indicating a proactive approach towards fostering better hygiene standards in their school environment (448, 29.2% agreed; 1026, 66.8% strongly agreed).

Conversely, some statements revealed a potential gap in essential hygiene resources as a significant number of students reported dissatisfaction. For instance, 23.1% of students expressed dissatisfaction with the availability of handwashing facilities, combining those who disagreed (205, 13.3%) and strongly disagreed (150, 9.8%) with the current provisions.

Moreover, regarding concerns about the impact of poor sanitation on disease spread, about 11.2% of students either disagreed (73, 4.8%) or strongly disagreed (98, 6.4%) with the idea that this is a pressing issue. This negative response may reflect a degree of complacency or a lack of awareness among a fraction of the student population about the serious consequences of inadequate sanitation, as detailed in table 2.

Table 2. Water, sanitation and hygiene attitudes among students in schools (N = 1536)

Attitude statements	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
I believe that practicing good sanitation and hygiene is important for my health.	25 (1.6)	13 (0.8)	18 (1.2)	321 (20.9)	1159 (75.5)
I feel that the school environment influences my personal hygiene habits.	58 (3.8)	69 (4.5)	173 (11.3)	641 (41.7)	595 (38.7)
I am confident in my knowledge of proper handwashing techniques.	41 (2.7)	38 (2.5)	140 (9.1)	553 (36.0)	764 (49.7)
I think it is important for the school to provide clean and safe drinking water.	22 (1.4)	16 (1.0)	31 (2.0)	236 (15.4)	1231 (80.1)
I believe that maintaining clean toilets or latrines contributes to a healthier school environment.	33 (2.1)	25 (1.6)	57 (3.7)	412 (26.8)	1009 (65.7)
I am concerned about the impact of poor sanitation on the spread of diseases among students and staff.	98 (6.4)	73 (4.8)	102 (6.6)	417 (27.1)	846 (55.1)
I am willing to participate in hygiene promotion activities at the school.	18 (1.2)	10 (0.7)	34 (2.2)	448 (29.2)	1026 (66.8)
I think that regular cleaning of shared spaces (e.g., classrooms, cafeteria) is essential for hygiene.	21 (1.4)	7 (0.5)	47 (3.1)	448 (29.2)	1013 (66.0)
I believe students should be educated about the importance of sanitation and hygiene from a young age.	22 (1.4)	11 (0.7)	47 (3.1)	331 (21.5)	1125 (73.2)
I trust the school administration to address sanitation and hygiene issues promptly.	41 (2.7)	56 (3.6)	164 (10.7)	610 (39.7)	665 (43.3)
I believe that my personal hygiene habits influence my overall well-being.	30 (2.0)	36 (2.3)	104 (6.8)	427 (27.8)	939 (61.1)
I am satisfied with the availability of handwashing facilities at the school.	150 (9.8)	205 (13.3)	156 (10.2)	449 (29.2)	576 (37.5)
I feel responsible for maintaining hygiene standards in my immediate environment at school.	40 (2.6)	39 (2.5)	101 (6.6)	527 (34.3)	829 (54.0)
I think that improving sanitation facilities can positively impact student attendance and performance.	406 (26.4)	346 (22.5)	183 (11.9)	267 (17.4)	334 (21.7)
I am open to learning new hygiene practices that can improve my health and well-being.	34 (2.2)	13 (0.8)	45 (2.9)	325 (21.2)	1119 (72.9)

Rural-urban comparison of descriptive statistics

Rural students exhibit a mean attitude score of 86.38%, which is marginally greater than the urban mean of 85.42%. Despite this distinction, both rural and urban settings reflect a commendably high level of positive attitude. Both groups show similar variability, with standard deviations of 8.991 for rural and 9.276 for urban students. The minimum and maximum scores range from 22.67 to 100 for rural students and 20 to 100 for urban students, respectively. The overall mean for all participants is 85.90%, demonstrating a consistent attitude distribution across locations, as illustrated in table 3.

Table 3. Rural-urban comparison of attitude descriptive statistics (N = 1536)

School Location	Mean	N	Std. Deviation	Std. Error of Mean	Minimum	Maximum	Range
Rural	86.38	768	8.991	0.324	22.67	100	77.33
Urban	85.42	768	9.276	0.335	20	100	80
Total	85.90	1536	9.144	0.233	20	100	80

Independent samples t-test for WASH attitudes scores

Table 4 summarizes an independent samples t-test comparing WASH attitude scores among 1536 participants. Levene's test shows equal variances (F = 0.004, P = 0.952). The t-test results indicate a significant difference in mean scores (t = -2.067, df = 1534, P = 0.039). The mean difference is -0.964, with a standard error of 0.466, and the 95% confidence interval ranges from -1.878 to -0.049, emphasizing the significance of the results.

Table 4. Independent Samples t-Test for WASH Attitude Scores (N = 1536)

Levene's test for equality of variances		t-test for equality of means						
F-value	P-value	t	df	P-value	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
							Lower	Upper
0.004	0.952	-2.067	1534	0.039	-0.964	0.466	-1.878	-0.049

Rural-urban comparison of attitude levels among students in schools

The figure compares attitude levels among students in rural and urban schools as high, moderate, or low. In rural areas, 82.4% of students exhibit a high attitude, while 79.8% do in urban settings, showing a more positive outlook among rural students. The moderate attitude percentage is higher in urban areas at 19%, compared to 16.5% in rural regions. Both areas have minimal low attitudes, with rural at 1% and urban at 1.2%. Overall, rural students display a stronger tendency towards high attitudes.

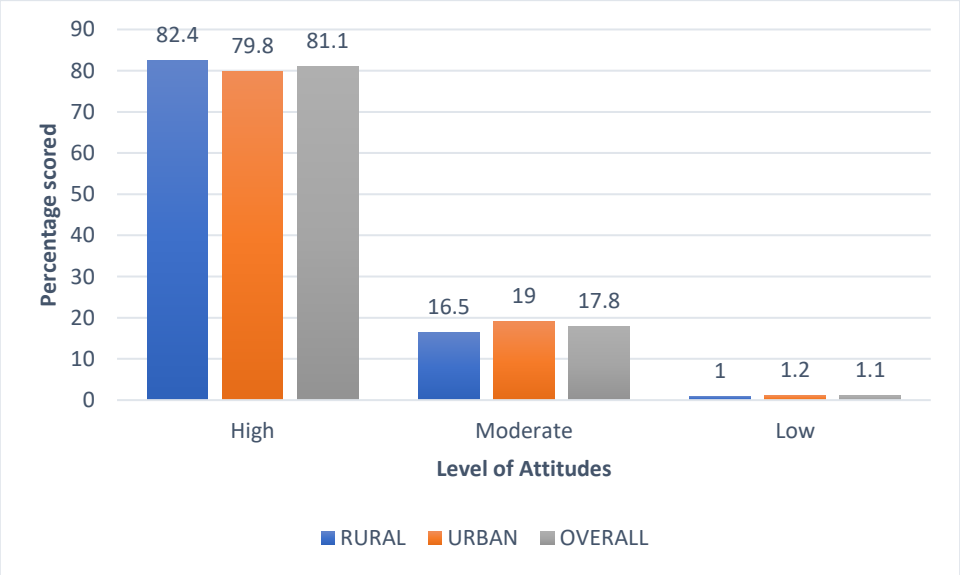

Figure. Rural-urban comparison of attitude levels among students in schools

Bivariate analysis of factors associated with the level of WASH attitudes among students in schools

Table 5 analyzes factors influencing WASH attitudes among 1,536 students, categorizing their attitudes into high, moderate, and low levels. Key predictor variables include age, gender, level of study, school location, type of school, school district, and living situation. Significant associations were found between the level of study and WASH attitudes (p = 0.020), between living situation and WASH attitudes (p = 0.002), and the type of school (public and privet) showing the strongest significant association (p < 0.001). Other factors, including school locations (rural and urban), did not show a statistically significant impact in this analysis.

Table 5. Bivariate analysis of factors associated with the level of WASH attitudes among students in schools (N = 1536)

	LEVEL OF ATTITUDES				
Predictor variables	**High**	**Moderate**	**Low**	**Chi-square**	**P- value**
	n (%)	**n (%)**	**n (%)**		
Age					
Under 10 years	58 (3.8)	12 (0.8)	0 (0.0)		
10-12 years	435 (28.3)	102 (6.6)	6 (0.4)		
13-15 years	420 (27.3)	105 (6.8)	8 (0.5)	8.984	0.344
16-18 years	288 (18.8)	48 (3.1)	2 (0.1)		
Over 18 years	45 (2.9)	6 (0.4)	1 (0.1)		
Gender					
Male	553 (36.0)	127 (8.3)	9 (0.6)	0.868	0.648
Female	693 (45.1)	146 (9.5)	8 (0.5)		
Level of study					
Primary School (Standard 5-7)	622 (40.5)	146 (9.5)	4 (0.3)		
Secondary school (Form 1-4)	556 (36.2)	122 (7.9)	12 (0.8)	11.681	**0.020***
High School (Form 5-6)	68 (4.4)	5 (0.3)	1 (0.1)		
School Location					
Urban	613 (39.9)	146 (9.5)	9 (0.6)	1.702	0.427
Rural	633 (41.2)	127 (8.3)	8 (0.5)		
Type of school					
Public	799 (52.0)	210 (13.7)	8 (0.5)	19.213	**< 0.001***
Private	447 (29.1)	63 (4.1)	9 (0.6)		
School district					
Iringa	613 (39.9)	146 (9.5)	9 (0.6)		
Kilolo	307 (20.0)	74 (4.8)	3 (0.2)	5.983	0.200
Mufindi	326 (21.2)	53 (3.5)	5 (0.3)		
Living situation					
Boarding student	398 (25.9)	58 (3.8)	6 (0.4)	12.406	**0.002***
Day student	848 (55.2)	215 (14.0)	11 (0.7)		

** P<0.05 is statistically significant*

Multinomial logistic regression odds ratios for factors associated with the levels of WASH attitudes among students in schools

Based on the provided multinomial logistic regression results, the level of study (primary school) and type of school (public) showed a statistically significant relationship ($p < 0.05$) with WASH attitudes among students. The odds of having a moderate attitude towards WASH compared to a poor attitude were significantly increased for students in primary school (Standard 5-7) by 62.8 (AOR = 62.789, p = 0.033, 95% CI = 1.384 - 2847.7). This indicates that primary school students are much more likely to have moderate attitudes towards WASH compared to those with poor attitudes. Attending a public school is associated with increased odds of having a moderate attitude towards WASH by 3.9 (AOR = 3.887, p = 0.024, 95% CI = 1.2 - 12.593). This suggests that students in public schools are more likely to display moderate attitudes toward WASH compared to those in private schools. These results highlight that being in primary school or attending a public school significantly increases the odds of having moderate attitudes toward WASH compared to poor attitudes. Other variables, including location (rural and urban), did not meet the threshold for statistical significance ($p < 0.05$), as described in table 6.

Table 6. Multinomial logistic regression for factors associated with the level of WASH attitudes among students in schools (N = 1536)

Predictor variables	High Vs Poor Attitude (Reference)					Moderate Vs Poor Attitude (Reference)				
	B	P-value	AOR	95% CI for AOR		B	P-value	AOR	95% CI for AOR	
				Lower	Upper				Lower	Upper
Age										
Under 10 years	-	-	-	-	-	-	-	-	-	-
10-12 years	-1.843	0.297	0.158	0.005	5.056	-2.253	0.224	0.105	0.003	3.958
13-15 years	-0.285	0.867	0.752	0.026	21.404	-0.74	0.679	0.477	0.014	15.875
16-18 years	1.168	0.5	3.217	0.108	95.703	0.362	0.841	1.436	0.041	49.888
Over 18 years	Reference									
Gender										
Male	-0.544	0.29	0.581	0.212	1.59	-0.487	0.354	0.614	0.219	1.723
Female	Reference									
Level of study										
Primary School (Standard 5-7)	2.906	0.115	18.292	0.491	681.137	4.14	**0.033***	62.789	1.384	2847.7
Secondary school (Form 1-4)	0.029	0.986	1.03	0.037	28.417	1.458	0.416	4.298	0.128	144.18
High School (Form 5-6)	Reference									
School Location										
Urban	0.135	0.823	1.144	0.351	3.731	0.456	0.463	1.578	0.467	5.331
Rural	Reference									
Type of school										
Public	0.771	0.181	2.162	0.699	6.688	1.358	**0.024***	3.887	1.2	12.593
Private	Reference									
School district										
Iringa	-	-	-	-	-	-	-	-	-	-
Kilolo	0.451	0.549	1.57	0.359	6.871	0.71	0.357	2.034	0.449	9.221
Mufindi	Reference									
Living situation										
Boarding student	0.65	0.324	1.916	0.526	6.976	0.613	0.37	1.846	0.482	7.065
Day student	Reference									

** P<0.05 is statistically significant, B = Coefficient, degree of freedom (df) = 1, CI=Confidence Interval, AOR=Adjusted Odds Ratio.*

DISCUSSION

The comparison of Water, Sanitation, and Hygiene (WASH) attitude scores between rural and urban students reveals a notable trend: rural students exhibit a mean WASH attitude score of 86.38%, slightly higher than the urban mean of 85.42%. Furthermore, the independent samples t-test demonstrated a statistically significant difference between the mean groups. This difference suggests that rural students generally have a more positive attitude toward WASH practices compared to their urban counterparts. Similarly, the study by Dekate and Mourya revealed a slightly higher attitude mean score for rural students compared to urban students, with rural students averaging 47.86% and urban students averaging 46.18%. This indicates that despite the overall low scores, rural school children demonstrate a more positive attitude toward handwashing techniques than their urban counterparts [17].

Several factors may contribute to this phenomenon, including educational interventions, socio-economic conditions, and cultural beliefs. This is supported by the studies revealed that while urban areas typically have better infrastructure, rural students may develop a more proactive attitude towards WASH due to the challenges they face in accessing clean water and sanitation facilities. This proactive approach can foster a greater appreciation for hygiene practices, as rural students often engage in community efforts to improve their local WASH conditions [18,19]. Preserving cultural beliefs in rural communities often leads to a more ingrained understanding of the importance of WASH, which can enhance positive attitudes among students [19,20]. This accompanied by the study of Gupta et al., highlighted that medical student from rural backgrounds show a significantly higher willingness to engage in rural health services compared to their urban counterparts, with 78.9% of rural students expressing interest in serving in these areas, as opposed to 57.8% from urban backgrounds [21].

Moreover, a systematic review highlighted that interventions aimed at improving WASH knowledge in schools have consistently resulted in better attitudes and practices among students, particularly in rural settings where such programs may be more impactful due to gaps in WASH access and education [1]. Furthermore, studies have shown that rural students often benefit from community-based educational initiatives that emphasize the importance of hygiene and sanitation, which can lead to improved attitudes towards these practices [22].

This study showed no significant relationship between rural and urban students in both bivariate and multinomial logistic regression analysis. These notable results align with another study in Tanzania, which revealed that while there were differences in knowledge levels, the attitudes towards hygiene practices did not significantly differ between rural and urban respondents. This indicates that despite the varying levels of access to WASH facilities, the underlying attitudes towards hygiene may be more influenced by cultural and educational factors than by geographic location alone [23]. Furthermore, supported by a study from South India found that handwashing facilities were inadequate in both urban and rural schools, with no significant differences in the availability of soap for handwashing [24]. This suggests that the lack of resources can lead to similar attitudes towards hygiene practices across different settings, regardless of whether they are urban or rural [24].

Conversely, other studies from Tanzania reported a significant relationship, indicating that children in rural areas were more susceptible to illnesses due to inadequate sanitation and hygiene practices, which negatively impacted their educational experiences and attitudes toward health [25-27]. The study advocates for comprehensive WASH programs that improve access and foster positive attitudes among students regarding hygiene and sanitation [26]. Other studies outside Tanzania found that younger learners in rural areas exhibited poorer attitudes towards hygiene compared to their urban peers, which may reflect broader educational and resource disparities [7,28,29].

Despite lacking a significant relationship in location, this study revealed a statistical relationship in other predictor variables, including the level of study and type of school (public and private), in both bivariate and multinomial logistic analyses with WASH attitudes, and living situations (day and boarding) with WASH attitudes in bivariate analysis. The findings align with a systematic review by Oh and Song., on adolescents' handwashing attitudes during the COVID-19 pandemic, which found that older students were more likely to engage in proper handwashing practices compared to younger students. This reinforces the idea that as students' progress through their educational journey, their attitudes and behaviors regarding hygiene practices improve, likely due to increased awareness and education about health issues [30]. Furthermore, the study by Patel et al., from India indicated that non-government school students exhibited significantly better WASH-related attitudes than their government school counterparts [19].

In a study focusing on boarding versus day students, Fidancı and Taci., found that boarding students exhibited better eating habits, which may extend to hygiene practices compared to day students. This finding aligns with the notion that boarding students often have more structured routines and access to consistent hygiene education, which can positively influence their attitudes toward WASH practices. The regularity of boarding school schedules may contribute to the development of better hygiene habits compared to the more variable routines of day students [31]. However, it contrasts with a systematic review by Paccaud et al., indicating that various socio-demographic factors, including the type of school and living situation, significantly influenced parents' attitudes toward inclusive education, extending students' attitudes to WASH education. The review emphasized that the high chance of parental involvement in day students and the educational environment are crucial in shaping students' attitudes toward hygiene practices [32].

CONCLUSION

The analysis of WASH attitudes indicates that rural students have a more positive outlook than urban students, with a mean score of 86.38% versus 85.42%. This difference, along with a higher proportion of rural students (82.4%) exhibiting strong positive attitudes compared to urban peers (79.8%), underscores the influence of location on student attitudes. Furthermore, factors such as education level, public and private school students, and student living arrangements, whether day students or boarding students are significantly associated with attitudes.

Acknowledgments

The author thanks Ruaha Catholic University (RUCU) for approving the ethical clearance and appreciates the regional and district education officers, heads of schools, and administrators for their invaluable support in this study.

Conflicts of Interest

No any conflict of interest in this study.

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المواقف تجاه المياه والصرف الصحي والنظافة الصحية بين الطلاب الريفيين والحضريين في منطقة إيرينجا، تنزانيا

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المستخلص

تتأثر مواقف الطلاب تجاه المياه والصرف الصحي والنظافة الصحية بالظروف الاجتماعية والاقتصادية والتصورات الثقافية وتوافر الموارد. عادةً ما يحصل الطلاب الحضريون على مرافق وتعليم أفضل للمياه والصرف الصحي والنظافة الصحية مقارنة بأقرانهم في المناطق الريفية. تلعب المعايير الثقافية والمشاركة المجتمعية دورًا حاسمًا في تعزيز ممارسات النظافة الإيجابية وتحسين النتائج الصحية، وخاصة في تنزانيا. فحصت الدراسة مواقف المياه والصرف الصحي والنظافة الصحية بين الطلاب في المناطق الريفية والحضرية في إيرينجا، تنزانيا، مع تسليط الضوء على التأثيرات الاجتماعية والاقتصادية على هذه المنظورات. قيمت هذه الدراسة مواقف المياه والصرف الصحي والنظافة الصحية بين الطلاب الابتدائيين والثانويين في المدارس الريفية (كيلوولو، موفيندي) والحضرية (بلدية إيرينجا) في إيرينجا، تنزانيا، من 4 إلى 25 يوليو 2024. تم استخدام تصميم مقطعي تحليلي كمي، بما في ذلك 1536 طالبًا تم اختيارهم عشوائيًا من 64 مدرسة. تم جمع البيانات باستخدام استبيانات منظمة وتحليلها بواسطة الحزمة الإحصائية للعلوم الاجتماعية، باستخدام الإحصاء الوصفي وقيم P للارتباطات والانحدار اللوجستي المتعدد الحدود لتحديد المتنبئين المرتبطين بالمواقف بين الطلاب. يبلغ متوسط درجات المواقف لدى الطلاب الريفيين 86.38٪، وهو أعلى قليلاً من الطلاب الحضريين بنسبة 85.42٪. يبلغ متوسط درجات المواقف الإجمالية لكلا المجموعتين 85.90٪. ومن الجدير بالذكر أن كل من البيئات الريفية والحضرية تظهر مستوى عالٍ من المواقف. يكشف اختبار t للعينات المستقلة عن فرق كبير (t = -2.067، p = 0.039). في المناطق الريفية، يتمتع 82.4٪ من الطلاب بموقف مرتفع مقارنة بـ 79.8٪ في المناطق الحضرية. تشمل المتنبئات الرئيسية لمواقف المياه والصرف الصحي والنظافة مستوى الدراسة ونوع المدرسة، حيث أظهر طلاب المدارس الابتدائية والحكومية مواقف معتدلة أعلى بكثير، وكلها مع ($p < 0.05$). يظهر الطلاب في المناطق الريفية مواقف أكثر إيجابية تجاه المياه والصرف الصحي والنظافة الصحية مقارنة بأقرانهم في المناطق الحضرية، مما يشير إلى الحاجة إلى برامج وموارد تعليمية مستهدفة لمعالجة التفاوتات في مختلف البيئات التي سلطت الضوء على فجوات المواقف.

الكلمات الرئيسية. المواقف، الصرف الصحي، النظافة، المياه والصرف الصحي والنظافة الصحية، الطلاب، تنزانيا.