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The Relationship Between Gender and School Pupils' Practice of Carrying Water from Home to School for Handwashing Practices in Lurambi Sub-County, Kakamega County, Kenya

[*1]Humphrey Buradi Zadock, [2]Daniel Muasya & [3]David Gichuhi

[1]Student, School of Education and Social Sciences, St. Paul's University

[2]Lecturer, School of Education and Social Sciences, St. Paul's University

[3]Lecturer, Karatina University

***Email of the Corresponding Author: humphreybz6910@gmail.com**

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Abstract

This study examines the relationship between gender and the practice of transporting water from home to school to promote handwashing among public primary school students in Lurambi Sub-County, Kakamega County, Kenya. Despite policy efforts to improve sanitation, gender disparities persist in schools, with girls frequently responsible for bringing water from home due to inadequate school water facilities. This cross-sectional survey was conducted in six administrative wards, with a target population of 14,779 students and head teachers from 12 schools. Taro Yamane's formula was used to calculate a sample size of 389 respondents. Data collection included questionnaires for students and key informant interviews with head teachers, allowing for a combination of quantitative and qualitative insights. Quantitative data were analyzed using SPSS, while qualitative data were processed using content analysis to identify recurring themes. The findings show that girls carry water from home disproportionately due to social expectations and insufficient school infrastructure, which has a negative impact on their attendance and participation in school. In addition, schools with reliable water supplies demonstrated a significant reduction in the need for students to bring water from home, emphasizing the importance of improved infrastructure in promoting equitable hygiene practices. The study concludes that addressing infrastructure gaps and social norms could help to reduce gender disparities in handwashing practices. It is recommended that schools receive adequate funding to improve water infrastructure and implement gender-sensitive policies to alleviate the burden on female students.

Keywords: *Gender, School Pupils' Practice, Carrying Water, Handwashing Practices, Lurambi Sub-County*

1.0 Background of the Study

Handwashing is universally acknowledged as one of the most cost-effective and practical interventions to reduce the transmission of infectious diseases (Gawai et al., 2016). This practice, which involves using soap and water to remove dirt, organic materials, and microbes from hands, is fundamental to preventing the spread of pathogens and promoting general health (Berhanu et al., 2022). Effective handwashing significantly reduces the likelihood of transmitting communicable diseases, particularly in dense environments like schools, where children are in close contact with one another. However, despite its proven benefits, handwashing practices in underdeveloped nations remain inadequate, with limited adherence to this essential health measure, especially in critical situations such as after using the restroom, before eating, and before handling food (Berhanu et al., 2022). This gap in hand hygiene practices in school settings is exacerbated by a lack of sufficient facilities, contributing to increased disease transmission among children and undermining public health efforts. The World Health Organization (WHO) and UNICEF have both emphasized the importance of establishing adequate hand hygiene facilities in schools, advocating for policies that prioritize handwashing as a public health imperative (UNICEF, 2021; WHO, 2020). Despite these recommendations, many low-resource settings still lack the necessary infrastructure to support consistent hand hygiene. Bishoge (2021) notes that while considerable efforts have been made to improve access to water and sanitation, these have not necessarily translated into functional handwashing facilities. The focus has often been on providing water, with less emphasis on ensuring that it is available at convenient and appropriate locations for hygiene practices. Kumwenda (2019) further suggests that without the provision of cost-effective and sustainable hygiene solutions, such as affordable handwashing stations with continuous access to soap and water, many schools will continue to struggle in maintaining adequate hygiene standards. These deficiencies in handwashing infrastructure are particularly problematic in primary schools, where young students are more vulnerable to disease.

Equitable access to handwashing facilities is essential to foster lifelong hygiene habits among students, yet disparities exist that often place a disproportionate burden on certain groups. Research by Osher et al. (2009) and UNICEF (2013) underscores the necessity for schools to provide basic amenities, including access to safe drinking water, clean toilets, and adequate hygiene education. Such facilities not only support students' health but also promote habits that extend into the home and community, creating a broader public health impact. For instance, UNICEF (2012) points out that schools equipped with safe drinking water and handwashing stations enable students to practice and internalize essential hygiene behaviors. However, the lack of reliable water sources, such as rainwater harvesting tanks or boreholes, can impede these efforts. According to the WHO and UNICEF Joint Monitoring Program (JMP), only schools with access to upgraded water sources like boreholes can be considered to have basic hygiene services, highlighting a significant gap in many educational institutions (WHO & UNICEF JMP, 2018).

Several studies have explored the challenges associated with implementing effective handwashing practices in schools, emphasizing the role of infrastructure and access in fostering these behaviors. Aiello et al. (2008) demonstrated that in the United States, inadequate hand hygiene was linked to higher rates of respiratory and gastrointestinal illnesses, particularly in communal environments. This research also highlighted that educational initiatives aimed at improving handwashing awareness and behavior resulted in increased compliance and reduced illness rates. Similarly, findings from the WHO/UNICEF Joint Monitoring Program indicate that in Mongolia, only about 41.4% of schools met the basic hygiene service criteria in 2016, with significant proportions of students failing to wash their hands before meals or after using the restroom (UNICEF, 2016). This lack of hygiene compliance in school settings underscores

the need for practical interventions, such as structured hygiene education and consistent access to handwashing facilities, to improve public health outcomes.

Gender disparities in handwashing practices are further exacerbated by inadequate facilities, with girls often facing additional challenges in maintaining hygiene in school environments. Kisaakye et al. (2021) found that in East African nations, including Kenya, there are specific policies designed to improve sanitation and hygiene, such as the Kenya Environmental Sanitation and Hygiene Policy (KESHP), which aims to achieve universal sanitation access by 2030. However, due to cultural and societal expectations, girls are more likely than boys to be involved in activities that ensure the availability of water for handwashing. Studies indicate that educational programs and policies can enhance handwashing practices, particularly among younger populations, yet they must address these gendered expectations to promote equitable hygiene behaviors (Mathai et al., 2010; Nteli et al., 2014). Furthermore, the Kenya Ministry of Education's National Education Sector Strategic Plan emphasizes the importance of reliable water and sanitation services in schools, as well as the need for hygiene education that can bridge gender gaps in handwashing practices (Ministry of Education, 2018).

1.1 Statement of the Problem

Despite national policies aimed at improving sanitation and hygiene in schools, gendered disparities in handwashing practices persist, particularly in Kenyan primary schools. This disparity is compounded by infrastructural challenges, as many schools lack reliable water sources and accessible handwashing stations, forcing students, especially girls, to carry water from home to school to meet their hygiene needs. According to Wichaidit et al. (2019), this additional responsibility placed on girls is linked to cultural expectations, where they are often more involved in tasks related to cleanliness and caregiving. The Kenya National Bureau of Statistics (KNBS) and UNICEF (2019) report that only 40% of schools have adequate handwashing facilities with soap and water, making it difficult for students to maintain consistent hand hygiene. This lack of facilities leads to absenteeism and impacts students' overall health and academic performance, disproportionately affecting girls who carry the added responsibility of providing water for hygiene (O'Reilly et al., 2021). Gender-based inequalities in handwashing practices pose a serious public health and educational challenge, as girls are more likely to miss school due to illness or inadequate sanitation facilities, particularly during menstruation. This situation not only jeopardizes their health but also undermines educational equity, limiting the benefits of schooling for female students. Without targeted interventions to address these disparities, the current infrastructure and social norms will continue to restrict handwashing practices and exacerbate gender inequalities in school settings.

1.2 Objective of the Study

To analyze the relationship between gender and school pupils' practice of carrying water from home to school for handwashing practices in Lurambi Sub-County, Kakamega County, Kenya.

1.3 Research Question

What is the association between gender and school pupils' practice of carrying water from home to school for handwashing practices?

2.0 Literature Review

This section provides a comprehensive examination of the theoretical and empirical foundations that inform this study on gendered practices of water-carrying for handwashing in schools. By focusing on established theories and empirical evidence, this review aims to

contextualize the role of gender in shaping water-carrying behaviors and the broader implications for hygiene practices and educational outcomes.

2.1 Theoretical Review

Grounded Theory (GT), introduced by Glaser and Strauss in 1967, is a qualitative methodology aimed at developing theory directly from data, making it especially valuable for understanding complex social behaviors and interactions. This study applies GT to explore how gender influences pupils' practices of carrying water from home to school for handwashing in Lurambi Sub-County, Kakamega County. Unlike traditional research approaches that start with a hypothesis, GT enables researchers to observe and interpret real-world behaviors, creating a theory that is closely aligned with participants' lived experiences. In the context of this study, GT helps illuminate the nuanced ways that gender roles and expectations shape water-carrying practices among pupils. Because grounded theory emphasizes an open and iterative data collection process, it is particularly suited for investigating school-based hygiene practices, where gender roles might influence not only who brings water but also how frequently and under what circumstances this responsibility is accepted or resisted (Glaser & Strauss, 1967). A significant strength of GT in this study is its alignment with the complex, often implicit social norms that shape pupils' behavior. Gender roles in many communities, particularly in resource-limited settings, play a central role in determining responsibilities related to water collection and household hygiene. As Thornberg (2017) notes, children's actions are profoundly influenced by the social and cultural frameworks of their immediate environments. GT allows researchers to uncover these underlying social norms through detailed, open-ended exploration, revealing how these expectations translate into specific behaviors within the school environment. This approach recognizes that gendered expectations—such as the perception that girls are more suited for caregiving tasks, including water collection—do not merely exist in isolation but are reinforced through daily interactions within families, schools, and communities. By employing GT, this study can delve into how these expectations manifest among pupils, shaping who assumes responsibility for carrying water and how this behavior is influenced by school and family norms around gender and hygiene.

Another valuable aspect of GT is its flexible approach to analyzing social interactions and the context-specific meanings participants attach to their actions. According to Charmaz (1990, 2014), constructivist GT acknowledges that knowledge is co-created within social contexts, making it particularly effective for interpreting practices that are influenced by collective beliefs, such as gender roles in school hygiene activities. In this study, GT helps unpack how students interpret and negotiate the gendered responsibility of bringing water to school, revealing how these practices are shaped by social learning. The iterative process of GT—where data collection and analysis inform each other—allows for a nuanced understanding of how students perceive their roles. For example, girls might internalize the idea that water-carrying is their responsibility, while boys may see it as outside their role, illustrating how gendered norms are learned and reinforced through both socialization and institutional practices. Through this approach, the study can reveal how pupils' responses to these expectations vary, potentially influenced by age, peer influence, and exposure to gender-neutral or gender-specific messaging about hygiene. In addition, GT's emphasis on process rather than predefined outcomes aligns with this study's focus on exploring gendered dynamics without imposing rigid assumptions. The constructivist orientation of GT allows researchers to interpret findings within the unique social and cultural landscape of each school, emphasizing that gender roles are not static but continuously constructed through interaction. By prioritizing process, GT enables an exploration of how behaviors, such as water-carrying, are negotiated and enacted differently by boys and girls in response to external pressures and internal motivations. For instance, Lincoln et al. (2011) highlight that GT's iterative approach fosters a

deeper exploration of how participants' attitudes evolve in response to contextual challenges—such as water scarcity or peer expectations—making it well-suited for identifying subtle shifts in how gendered responsibilities are understood and enacted over time. This flexibility is crucial for understanding how social and environmental factors, like school size or family background, intersect with gender to influence pupils' practices around carrying water from home. Therefore, Grounded Theory offers an adaptable, data-driven framework that supports a nuanced investigation into the gendered practices surrounding water-carrying in Lurambi Sub-County. By using GT, this study seeks to develop a grounded understanding of how gender roles shape handwashing behaviors and responsibilities among pupils, revealing the social and cultural dynamics that underlie these practices. Through a careful, context-sensitive analysis, GT allows for an exploration of both the pressures and motivations that shape students' decisions around water-carrying, ultimately providing a richer understanding of how gender influences pupils' engagement with hygiene practices in school settings.

2.2 Empirical Review

In low- and middle-income countries (LMICs), the absence or unreliability of water services in schools often requires pupils to bring water from home to meet basic hygiene needs, including handwashing. This responsibility is influenced by various factors, with gender playing a significant role in determining the frequency, responsibility, and burden of water-carrying among students. Gender roles, particularly in rural and resource-poor settings, tend to assign household and caregiving tasks, including water collection, disproportionately to girls. This empirical review explores the association between gender and the practice of carrying water from home to school for handwashing, emphasizing disparities in responsibility, impacts on handwashing practices, and broader implications for education and health outcomes. Gender strongly influences which pupils are responsible for carrying water from home. In many contexts, girls are often expected to manage tasks related to water collection and hygiene, a responsibility that extends into the school environment. For instance, Sommer et al. (2015) found in Tanzanian schools that girls were more frequently tasked with bringing water compared to boys, reflecting traditional gender roles where girls handle domestic chores, including water collection for hygiene purposes. Similarly, Erismann et al. (2016) observed in rural Burkina Faso that girls were more likely than boys to bring water to school, a practice that often disrupted their education. While boys occasionally assisted, girls were expected to bring water consistently, especially in schools with unreliable water supplies, creating a gendered burden that affected their participation in school activities.

The task of carrying water to school places an additional burden on girls, who frequently shoulder this responsibility. Garn et al. (2017) highlighted in rural Tanzania the physical and time-related challenges associated with this gendered division of labor. Girls who brought water to school were often late or absent, particularly if they had to travel long distances to fetch water, which reduced their instructional time and negatively impacted their academic performance. Similarly, Caruso et al. (2014) found in Zambian schools that girls carrying water to school for handwashing reported higher rates of fatigue and absenteeism compared to boys. Additionally, girls often prioritized water for other needs, such as menstrual hygiene, over handwashing, particularly when water was scarce. This increased the risk of poor hand hygiene, contributing to higher rates of waterborne diseases and absenteeism among girls. In many communities, water collection is viewed as a female responsibility, reinforcing gender disparities within schools. Chard et al. (2019) examined in Ethiopia how gender norms around water collection shaped pupils' behaviors, finding that girls were often socialized to see it as their duty to ensure sufficient water for hygiene practices, including handwashing. Boys, however, were less likely to view water collection as their responsibility and thus contributed less frequently. This gendered perception of water collection responsibilities can have long-

term effects on pupils' attitudes toward hygiene. Trinies et al. (2016) in India found that girls who were responsible for bringing water adhered more consistently to hygiene practices such as handwashing, while boys were less consistent. This study highlighted the need for gender-sensitive WASH (Water, Sanitation, and Hygiene) interventions in schools to ensure that both boys and girls understand the importance of handwashing and share responsibility for water collection.

The gendered burden of water collection also has health implications, particularly for girls. Migele et al. (2007) found in Kenyan schools that girls who brought water to school were less likely to wash their hands consistently, due to the strain of carrying water over long distances. The study revealed that girls often prioritized drinking water over handwashing when supplies were limited, contributing to higher rates of hygiene-related diseases such as diarrhea among girls. In contrast, boys, who rarely brought water, were less likely to wash their hands when water was unavailable at school. Dreibelbis et al. (2013) observed a similar trend in Bangladeshi schools, where boys were more likely to skip handwashing altogether if water was not readily accessible. While both boys and girls faced health risks from unreliable water supplies, the burden of water collection and its associated health consequences were disproportionately experienced by girls. Socioeconomic factors also shape gendered patterns of water-carrying. O'Reilly et al. (2008) found in Zimbabwe that girls from lower-income households were more likely to bring water to school, as they were often tasked with water collection duties at home. In wealthier households, where water access was more reliable, both boys and girls were less likely to bring water. The study noted that socioeconomic status, combined with gender norms, influenced pupils' ability to engage in proper hygiene practices, with girls from low-income families bearing the heaviest burden. Freeman et al. (2012) observed a similar pattern in Kenyan schools, finding that girls from poorer households were more frequently absent due to water collection duties, especially during water shortages. These findings underscore the need to address both gender and socioeconomic disparities in WASH programs to ensure equitable access to hygiene facilities.

Several studies have recommended interventions to address gender disparities in water collection and handwashing practices among school pupils. Jasper et al. (2012) emphasized the importance of improving school water infrastructure in Uganda to reduce the need for pupils to bring water from home. Their study found that schools with reliable water supplies experienced fewer gender disparities in water-carrying practices, as both boys and girls had access to water for handwashing. Mwaki et al. (2016) in Kenya advocated for the implementation of gender-sensitive WASH programs that involve both boys and girls in water collection and hygiene, challenging traditional gender norms and promoting shared responsibilities. Such programs encourage boys to play an active role in water collection and handwashing, thereby reducing the gendered burden on girls and improving hygiene outcomes for all pupils. Empirical evidence clearly demonstrates a strong association between gender and the practice of carrying water from home to school for handwashing. In many LMICs, girls disproportionately bear this responsibility, a task often reinforced by traditional gender norms. This gendered burden not only affects girls' handwashing practices but also impacts their educational experience, leading to increased absenteeism and fatigue. While boys are less likely to bring water, they are also less consistent in their handwashing practices, especially when water is scarce.

2.3 Conceptual Framework

The conceptual framework for this study is grounded in the principles of Grounded Theory (Glaser & Strauss, 1967) and the socio-ecological model, which considers how individual

behaviors, such as water-carrying practices for handwashing, are shaped by intersecting influences at the personal, interpersonal, and institutional levels (Bronfenbrenner, 1979).

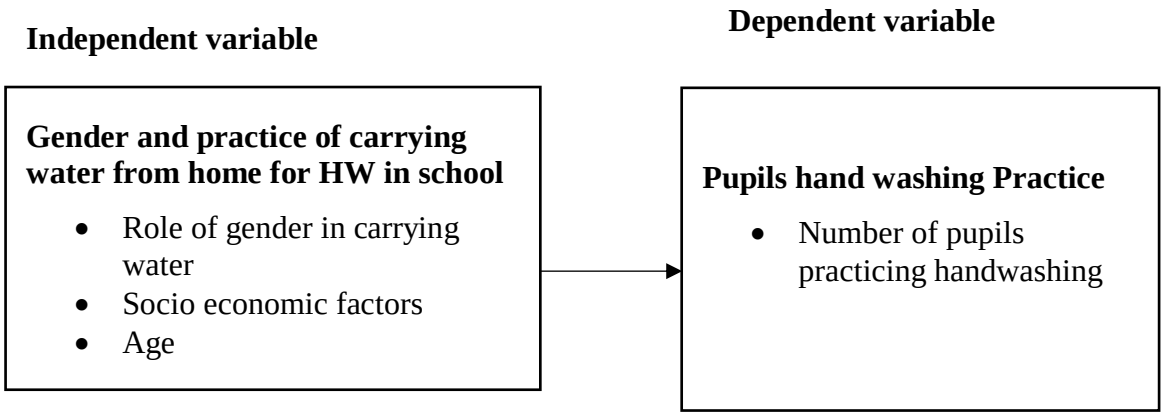

Figure 1: Conceptual Framework

3.0 Methodology

The study used a cross-sectional survey design to gather data on gender-related behaviors concerning water-carrying among pupils in Lurambi Sub-County, Kakamega County. The target population included public primary school students from grades 5 to 8, totaling 14,767, as well as 12 head teachers from the study area. A sample size of 389 respondents was determined using the Taro Yamane formula, ensuring representation of the student population and key informants. Cluster sampling was employed to select participants from six administrative wards, ensuring balanced geographic representation. Within each selected school, students were chosen through simple random sampling, while head teachers were purposively sampled due to their managerial insights on WaSH (Water, Sanitation, and Hygiene) practices. Data collection involved structured questionnaires for students and key informant interviews with head teachers, providing both quantitative and qualitative data. The quantitative data was analysed using the Statistical Package for Social Sciences (SPSS) for descriptive statistics, such as frequencies and percentages, while qualitative data from interviews underwent thematic content analysis to identify recurring gender-specific patterns in water-carrying practices.

4.0 Findings and Discussions

In examining the association between gender and pupils' practice of carrying water from home to school for handwashing, data revealed notable gender-based disparities in water-carrying practices. Findings demonstrate that girls were more frequently responsible for bringing water from home to support school handwashing facilities. This gendered trend not only reflects traditional gender roles within the community but also impacts girls' school experience, academic performance, and hygiene practices. The data analysis presented below includes tables and figures to illustrate these findings in detail.

4.1 Gender Distribution in Water-Carrying Practices

Table 1 present the distribution of pupils who reported carrying water from home by gender. The table shows that a significant percentage of female pupils were involved in this practice compared to male pupils.

Table 1: Gender Distribution of Pupils Carrying Water from Home

Gender	Number of Pupils	Percentage (%)
Female	225	58%
Male	162	42%
Total	387	100%

From the table, 58% of the pupils who carried water to school were female, while 42% were male, illustrating that girls bore a larger share of this responsibility.

4.2. Frequency of Water-Carrying by Gender

Further data collection on the frequency of water-carrying per week highlighted a gender disparity. Female pupils reported carrying water more frequently compared to male pupils, which affects their availability for classroom activities and overall educational engagement.

Table 2: Frequency of Water-Carrying by Gender (per Week)

Frequency	Female (%)	Male (%)
Daily	32	14
2-3 times	40	28
Once	26	58
Never	2	0

Girls showed a higher frequency in carrying water daily (32%) or 2-3 times a week (40%), while most boys only carried water once a week (58%). This higher frequency among girls underscores the extra responsibility shouldered by female pupils.

4.3. Impact of Water-Carrying on School Attendance and Performance

A cross-tabulation analysis was conducted to explore the relationship between the frequency of carrying water and reported absences. The results indicated that female students who carried water frequently were more likely to miss class, with many reporting fatigue and absenteeism directly linked to this responsibility.

Table 3: Cross-Tabulation of Absenteeism and Water-Carrying Frequency by Gender

Gender	Frequent Absences (3+ days/month)	Rare Absences (<3 days/month)	Total
Female	45 (20%)	180 (80%)	225
Male	10 (6%)	152 (94%)	162

Female pupils were three times more likely than male pupils to report frequent absences, often citing fatigue from carrying water as a primary cause.

4.4. Hygiene Practices and Health Outcomes

Analysis revealed that due to the burden of carrying water, female pupils often prioritized drinking over handwashing, particularly on days when they had to transport water over long distances. This prioritization was reflected in self-reported hygiene practices and incidences of hygiene-related health issues.

Table 4: Reported Hygiene Practices After Water-Carrying by Gender

Gender	Always Wash Hands After Toilet Use (%)	Often Wash Hands After Toilet Use (%)	Rarely Wash Hands After Toilet Use (%)
Female	50	30	20
Male	65	25	10

Female students, especially those tasked with frequent water-carrying, were less likely to consistently wash their hands after using the toilet due to limited water availability, highlighting a potential health risk.

4.5. Teacher Observations and Gender-Based Trends

Key informant interviews with head teachers provided qualitative insights into gender roles and their effect on water-carrying practices. Many teachers reported that girls were often assigned the task of carrying water as it was perceived as a natural extension of their domestic responsibilities, both by the school administration and the pupils' families. Teachers also noted that these expectations resulted in a significant physical burden on girls, particularly those who had to carry water multiple times a week, affecting their concentration in class. In summary, the study illustrates a clear gender disparity in the practice of carrying water from home for school handwashing purposes. Girls are more frequently tasked with this responsibility, often at a detriment to their health, school attendance, and hygiene practices. These gender-based practices reflect broader social norms and impose a disproportionate burden on female pupils, reinforcing the need for school-based interventions that reduce reliance on students to supply water and encourage equitable distribution of tasks.

5.0 Conclusion

The findings reveal a significant gender disparity in the responsibility of carrying water from home for handwashing in schools, with female pupils disproportionately affected. This practice not only reinforces traditional gender roles but also imposes additional physical and educational burdens on girls, impacting their school attendance, academic performance, and overall well-being. Female pupils, tasked more frequently with water-carrying, face challenges in maintaining consistent hand hygiene due to the limited water they can carry. These findings underscore the need for equitable approaches in school water management, as the current system places an undue burden on girls and affects their ability to fully participate in and benefit from the school environment.

6.0 Recommendation

To address this disparity, it is recommended that schools receive support for installing reliable water sources and handwashing facilities on-site, reducing the need for pupils to bring water from home. Community and school-level interventions should promote shared responsibilities for water-carrying tasks, engaging both boys and girls equally in hygiene practices. Additionally, gender-sensitive programs within schools can help shift cultural perceptions,

ensuring that water-carrying is not solely viewed as a female responsibility. Finally, partnerships with local stakeholders and government initiatives to improve school WaSH infrastructure would be critical in fostering a more supportive and equitable educational environment for all students.

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