



**MENSTRUAL HYGIENE IS NOT OBVIOUS AMONG
ADOLESCENT GIRLS IN LOW-RESOURCE SETTINGS:
PROMOTING IT IS A PRIORITY**

^{1*}Fabius Wafula, ¹Mary Wanjira Kamau, ¹Rose Gitau, ¹Phyllis Kaingu

¹Department of Nursing Sciences, University of Nairobi, Kenya

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

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ABSTRACT

Background: Menstrual hygiene management (MHM) is a vital component of adolescent reproductive health, yet it remains inadequately practiced among girls in many low-resource settings. Cultural taboos, limited access to affordable sanitary materials, and poor water and sanitation infrastructure continue to undermine safe and dignified menstrual practices. This study assessed the knowledge, attitudes, and practices regarding menstrual hygiene among adolescent girls in Lari Sub-County, Kiambu County, Kenya.

Methods: A descriptive cross-sectional study was conducted between 4th and 31st July 2023 among 365 secondary school girls aged 13–20 years, randomly selected from 10 schools in Lari Sub-County. Data were collected using structured questionnaires and analysed using STATA and SPSS.

Results: The study included 365 girls aged 13–20 years (mean 16 years), with most attaining menarche at 14 years (29.6%). Most respondents (86%) had heard about menstrual hygiene and 72.3% received information before menarche, mainly from parents (47.5%) and teachers (45.5%). Overall, 59% were knowledgeable, with knowledge significantly varying by school ($\chi^2 = 18.047$, $p = 0.035$). Attitudes were moderately positive (53%), though 29.6% felt embarrassed and 21.4% viewed menstruation as spiritually unclean. Regarding practices, 55.1% cleaned with water only, disposal was mainly via pit latrines (57.8%) and bins (38.1%), and 65.8% avoided places of worship during menstruation.

Conclusion: Despite relatively high access to menstrual hygiene materials, knowledge levels remain moderate and several barriers persist, including inadequate water access, stigma, and unsafe disposal practices. Strengthening menstrual health education, improving WASH infrastructure, and enhancing community sensitization are essential interventions to promote safe menstrual hygiene management and improve the dignity, wellbeing, and school participation of adolescent girls.

Keywords: *Menstrual hygiene management, adolescent girls, menstrual stigma, sanitary materials, reproductive health, Kenya.*

BACKGROUND

Menstruation is a natural physiological process experienced by females of reproductive age (van Lonkhuijzen et al., 2023). However, in many societies, it remains a taboo subject, leading to misinformation, limited awareness, and poor menstrual hygiene management (MHM). According to the World Health Organization (WHO, 2017), inadequate menstrual hygiene can result in health complications such as urinary tract infections (UTIs), reproductive tract infections (RTIs), and psychosocial issues including low self-esteem and school absenteeism.

In Kenya, many adolescent girls face significant challenges in managing menstruation due to economic constraints, lack of access to sanitary products, and inadequate water, sanitation, and hygiene (WASH) facilities in schools. Studies indicate that over 65% of Kenyan women and girls cannot afford sanitary pads, forcing them to use unhygienic alternatives such as old cloth, newspapers, or mattress stuffing (Korir et al., 2018; Manyara & Okube, 2023). These practices not only increase the risk of infections but also contribute to poor school attendance and reduced academic performance.

Adolescents' reproductive health encompasses physical, emotional, and social well-being related to the reproductive system. WHO emphasizes that reproductive health education should begin in early adolescence to equip young girls with accurate information and the resources necessary to manage menstruation safely (MacRae et al., 2019). However, in many low-income settings, girls receive little to no education about menstruation prior to menarche. A study in Ghana found that nearly 50% of adolescent girls lacked basic knowledge about menstruation before their first period, often resulting in fear, confusion, and unhygienic practices (Kumbeni et al., 2020).

Menstrual hygiene is a critical but often neglected component of adolescent reproductive health. Poor MHM contributes to increased risk of infections, including bacterial vaginosis and UTIs (MacRae et al., 2019). Additionally, the inability to manage menstruation effectively contributes to school absenteeism. Research from Uganda showed that 28% of adolescent girls miss school during their periods, negatively impacting their academic

outcomes and confidence (Miiró et al., 2018). Promoting menstrual hygiene is thus essential to improving girls' health, education, and overall well-being.

In many African communities, menstruation is surrounded by stigma, secrecy, and cultural taboos. These societal norms hinder open discussion about menstruation between girls and their parents, teachers, or peers. A study in India found that only 36% of girls felt comfortable discussing menstruation with their mothers, which often led them to rely on peers or the internet for information (Kashyap & Choudhari, 2023). In some cultures, menstruation is associated with impurity, leading to social exclusion and restrictions from religious or communal activities (van Lonkhuijzen et al., 2023).

This stigma can severely affect girls' mental and emotional health. In Kenya, 21% of adolescent girls reported feeling spiritually unclean during menstruation, resulting in social isolation and shame (Rossouw & Ross, 2021). A similarly study in Ethiopia found that 60% of girls avoided participating in social activities while menstruating due to fear of teasing and embarrassment (Michael et al., 2020). Combating menstrual stigma requires comprehensive sexuality education and public awareness campaigns that normalize menstruation and promote menstrual dignity.

The lack of access to clean and affordable menstrual products remains a major barrier for adolescent girls, particularly in low-income communities. Research shows that over 500 million women worldwide lack access to adequate menstrual hygiene resources, and in extreme cases, girls resort to using newspapers, leaves, or even cow dung (Chothe et al., 2014). In Kenya, up to 65% of girls cannot afford sanitary pads, while in Ethiopia, 62.4% rely on rags or cloth due to financial limitations (Michael et al., 2020).

While reusable menstrual products such as cloth pads and menstrual cups offer cost-effective alternatives, awareness and acceptance of these options remain low. Many girls fear leakage, discomfort, or social ridicule, deterring their use. Addressing these challenges requires expanding access to affordable or free sanitary products and promoting education on safe menstrual hygiene practices.

Menstrual hygiene education is also inadequate in many regions. Studies show that large proportions of girls have little or no knowledge about menstruation before menarche. For instance, in Pakistan, 49% of girls were unaware of menstruation before their first period, leading to confusion and fear. (Michael et al., 2020). In Kenya, this lack of education is compounded by limited parental involvement and gaps in school-based health education. Many teachers lack the training or confidence to address menstrual health topics, and some parents believe that such discussions are inappropriate or should be left to schools (Kumbeni et al., 2020).

To ensure adolescent girls are well-prepared, comprehensive menstrual health education should be integrated into school curricula, and both teachers and parents should be empowered to provide accurate, age-appropriate guidance. Public health initiatives should also focus on reducing stigma, improving WASH infrastructure, and ensuring product accessibility, especially in rural and underserved areas (Alexander et al., 2018).

METHODS

Study Design and Setting

This study adopted a descriptive cross-sectional design. It was conducted in Lari Sub-County, in the Western part of Kiambu County, a leading innovative commercial hub that is considered as one of the wealthiest counties in Kenya. Lari Sub-County is divided into five wards: Lari/Kirenga, Kijabe, Kamburu-Kamuchege, Kinale and Nyanduma. The Sub-County has 128 schools. Of these, 87 are primary schools and 41 are secondary schools (County government of Kiambu, 2021), with approximately 8,540 girls aged 14 to 19.

Target Population and Sampling

The study population comprised adolescent girls aged 13–20 years attending secondary schools in Lari Sub-County. A sample size of 365 students was determined using Fisher's formula. A total of 10 schools participated in this study. Two schools were chosen from each of the 5 wards, one in the interior rural and one in the semi-urban region, for proper representation of each region in the ward. The number of participants from each school was determined by the number of students in each school relative to the sample size. Since

each school had a different number of students, the number of participants from each school was allocated proportionally to the total number of adolescent girls at that school.

Data Collection Methods

Data was collected using semi-structured self-administered questionnaires. The questionnaires collected information from adolescent girls practicing menstrual hygiene in Lari Ward, Kiambu County. The questionnaires were divided into four parts, namely: socio-demographic data, knowledge, attitude, and practices of menstrual hygiene. The study questionnaires were pretested at Kambaa Girls High School. The pre-testing helped determine the reliability and validity of the data collection tool. The pre-test study results guided the necessary adjustments in the data collection tool.

Data collection procedure

Permission to collect data was given by the Lari sub-county Ministry of Education offices and the heads of the participating schools. Eligible students were identified with the help of the teachers. Information about the study, its risks, and benefits was provided to eligible students. The students who agreed to participate in the study signed an informed assent. They were allowed to participate during breaks to avoid interrupting school programs, and all who gave their consent were included in the study. All those students who met the inclusion criteria were sampled to participate in the study using a proportionate sampling method, the total sample size being 365. They were then given questionnaires about sociodemographic factors, knowledge of menstruation, and their menstrual practices. The questionnaire took approximately 10 minutes to complete. Measures to curb the spread of COVID-19 put in place include hand sanitization before taking part in the study, the use of face masks, and the sanitization of pens. The researcher used study numbers on the questionnaires to ensure the privacy and confidentiality of all participants' information. At the end, before releasing the respondent, the questionnaires were checked for completeness and kept under the key and lock for safety. The researchers would then provide sanitary materials and health education on safe menstrual hygiene, as per the details on the questionnaire. This was followed by a very interactive session of questions and answers to provide more health education on adolescent and reproductive health issues.

Data analysis

The data collection tool was reviewed at the end of the day to verify the completeness and accuracy of the information. Irrelevant information was deleted before entering the data into the computer. Data coding was used to maintain the anonymity and confidentiality, as assured to them during the explanation of the assent.

Quantitative data coded after collection were entered into the computer, cleaned, and validated using the Statistical Package for the Social Sciences (SPSS) version 26. Data entry was done during the study to minimize errors. It was then exported to STATA version 16 for analysis. Descriptive statistics, including univariate analysis: simple proportions, n (%), for categorical variables and mean with standard deviation for continuous variables was described. Bivariate analysis, using the chi-square test, was done to describe the relationship between the knowledge and practice, as well as the attitude and practice of menstrual hygiene. Multivariate analysis using logistic regression was used to control confounders and determine the association between variables to check for their significance. A P-Value of < 0.05 was considered significant at 95% confidence interval. The results were presented graphically in frequencies, percentages and summary statistics like tables and various charts.

Ethical Considerations

Approval to conduct the study was obtained from the KNH-UON ethical review committee (Ref: KNH-ERC/ protocol number UP10/01/2023), whereas the study permit was obtained from the National Commission for Science, Technology and Innovation (NACOSTI), License number **561610**. Permission to conduct the study was also obtained from Kiambu County and Lari Sub-County education offices, as well as the administration of each secondary school involved.

The participants benefited from receiving a health talk on menstrual hygiene, and a packet of sanitary towels in an effort to promote menstrual hygiene.

RESULTS

This chapter presents findings on the socio-demographic characteristics of respondents, as well as their knowledge, attitudes, and practices regarding menstrual hygiene management. The section further reports key statistical associations and highlights differences across schools.

Socio-demographic characteristics

A total of 365 adolescent girls participated in the study. Respondents were aged 13–20 years, with a mean age of 16 years ($SD \pm 1.3$) and a modal age of 15 years. The largest proportion of participants was in Form Two (32.9%, $n=120$). All respondents identified as Christians. Most participants resided in Lari Sub-County (75.9%, $n=277$), while smaller proportions came from Kikuyu (2.2%, $n=8$) and Limuru (1.9%, $n=7$). Regarding age at menarche, the majority reported first menstruation at 14 years (29.6%, $n=108$). A small proportion (0.8%, $n=3$) reported onset at age 10, while a few had not yet begun menstruating at the time of the study.

Knowledge of Menstrual Hygiene

This section summarizes respondents' awareness and understanding of menstruation and menstrual hygiene management, including overall knowledge levels based on composite scoring.

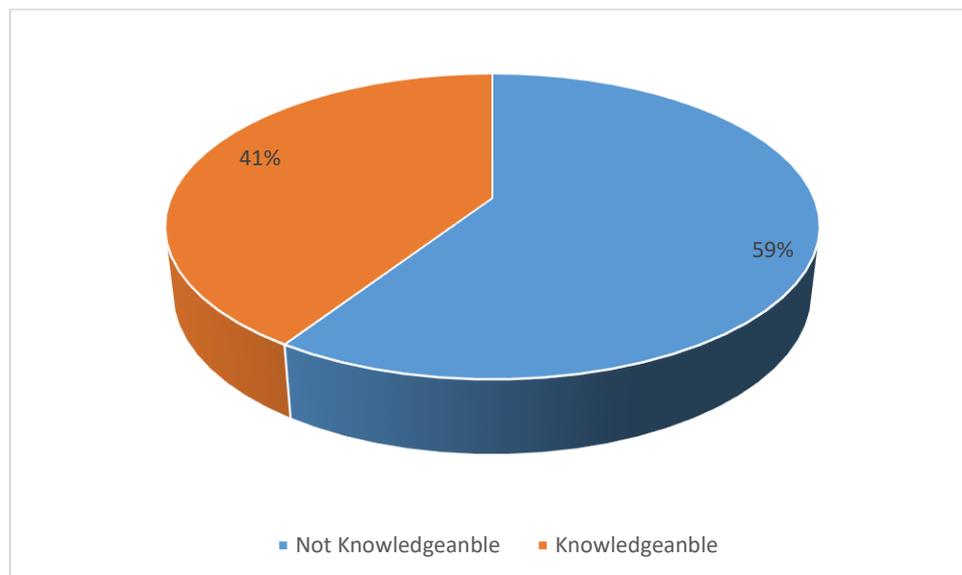


Figure 1: Knowledge of Menstrual Hygiene

Knowledge of menstrual flow characteristics was generally high: 82.5% (n=311) correctly reported that menstruation lasts between 1–7 days, while 97.4% (n=357) identified the reproductive system as the source of menstrual blood. In addition, 96.2% (n=351) correctly described menstrual blood as reddish in colour.

Overall knowledge was assessed using a composite score derived from eight knowledge-related items. Using a median cutoff score of 19, respondents with scores ≥ 20 were classified as knowledgeable. Based on this criterion, 59% of respondents were knowledgeable, while 41% were not.

Knowledge levels differed significantly by school ($\chi^2 = 18.047$, $p = 0.035$). The highest proportion of knowledgeable respondents was recorded in St. Augustine Nyanduma Secondary School (55%), while the lowest was in Mbau-ini Secondary School (22.5%).

Attitudes towards Menstruation

This subsection presents findings on adolescents’ perceptions and feelings about menstruation, including overall attitude classification based on a composite attitude score.

Table 1: Attitude towards Menstruation

		n	%
Certain practices should be observed during menstruation	True	74	20.3
	False	291	79.7
When menstruating, no one else should be aware	I agree	186	51
	I don't agree	148	40.5
	I don't know	30	8.2
	I don't agree	1	0.3
I can freely talk about menstrual health	I agree	298	81.6
	I don't agree	44	12.1
	I don't know	23	6.3
I always feel embarrassed when my peers know that I am menstruating	I agree	108	29.6
	I don't agree	233	63.8
	I don't know	24	6.6
I always feel less confident when menstruating	I agree	182	49.9
	I don't agree	157	43
	I don't know	26	7.1
I can freely engage with other students during my menstruation	I agree	249	68.2
	I don't agree	88	24.1
	I don't know	28	7.7
Menstruation is shameful	I agree	58	15.9
	I don't agree	276	75.6

	I don't know	31	8.5
It is good to inform others of any abnormalities during menstruation period	I agree	184	50.4
	I don't agree	117	32.1
	I don't know	64	17.5
Menstruation makes one unclean spiritually	I agree	78	21.4
	I don't agree	241	66
	I don't know	46	12.6

Most respondents demonstrated generally positive perceptions toward menstruation. A large proportion (75.6%) believed menstruation is not shameful and should not limit daily activities. Further, 81.6% reported that they could talk openly about menstrual health, while 70.4% believed it is important to inform others when menstrual abnormalities occur. Slightly more than half (58.1%) indicated that they could freely interact with peers during menstruation.

However, stigma-related attitudes remained evident, as 29.6% reported feeling embarrassed during menstruation and 21.4% believed menstruation makes one spiritually unclean.

Composite scoring of attitude items showed that 53% of respondents had a positive attitude toward menstruation, while 47% demonstrated a negative attitude.

Menstrual Hygiene Practices

This subsection reports respondents' menstrual hygiene practices, including cleaning, disposal methods, privacy, access to water, and use of sanitary materials.

Table 2: Menstrual Hygiene Practices

		n	%
Who you prefer to talk to during menstruation	Parents	271	74.2
	Teachers	38	10.4
	Peers	28	7.7
	None	21	5.8
	I don't know	4	1.1
	Others	3	0.9
How do you clean your vagina after menses?	Using Water only	204	55.9
	Using soap and water	156	42.7
	Other- towel/water	2	0.5
	Toilet paper	2	0.5
	Water and bathing towel	1	0.3
Is it possible to spot a used pad or cloth on the ground in the school environment?	No	277	75.9
	Yes	88	24.1
Where do you dispose used pads or cloth?	Pit latrine	211	57.8
	Bins	139	38.1
	Open pit	15	4.1
Which type of facilities do you use when Changing pads or cloths	Private rooms	330	90.4
	Open washrooms	32	8.8
	Anywhere	2	0.5
	Pit latrine	1	0.3
What type of water source do you have in your sanitation/cleaning facilities at home?	Running water	227	62.2
	Super drums	97	26.6
	No active source of water	40	11.0
	Private rooms	1	0.3
How do you acquire sanitary materials?	From parents or guardians	338	92.6
	Donations from school	20	5.5
	Others	7	1.9
I don't tell anyone when I'm having menstruation	True	207	56.7
	False	158	43.3
I don't attend places of worship when I'm having menstruation	True	240	65.8
	False	125	34.2
Have you used the following during your menstrual periods?	No	346	94.8
	Yes	19	5.2

Regarding vaginal cleaning, 55.1% of respondents reported using water only, while 41.9% used soap and water. Disposal practices varied, with most respondents disposing of used sanitary materials in pit latrines (57.8%) or bins (38.1%), while 4.1% reported disposing of them in open pits.

Most respondents (90.4%) reported having access to private rooms for changing menstrual materials, while 8.8% relied on open washrooms. Access to water was inconsistent: 62.2% reported having running water at sanitation facilities, 26.6% used stored water in drums, while 11.0% reported having no active water source.

In terms of access to sanitary materials, the majority (92.6%) obtained pads or other materials from parents or guardians, while 5.5% received donations from school. A small proportion (5.2%) reported using inappropriate materials such as rags, mattress pieces, toilet paper, or washable cloth.

Cultural and religious restrictions were also common, with 65.8% of respondents reporting that they avoided attending places of worship during menstruation.

DISCUSSIONS

This study assessed menstrual hygiene knowledge, attitudes, and practices among adolescent girls in Lari Sub-County. The findings reveal both encouraging aspects and areas requiring intervention, consistent with previous research in similar settings.

Knowledge of menstrual hygiene

Although 85.8% of respondents had heard about menstrual hygiene, only 59% demonstrated adequate knowledge based on composite scoring. This finding is consistent with evidence from low- and middle-income countries showing that while general awareness of menstruation is relatively high, comprehensive knowledge on menstrual physiology and hygienic management remains inadequate among many adolescent girls. For example, UNICEF (2019) reports that many girls in resource-limited settings receive incomplete or inaccurate menstrual health information, which contributes to misconceptions, poor hygiene practices, and continued stigma surrounding menstruation. Similarly, a cross-sectional study in Nigeria (Rossouw & Ross, 2021) reported knowledge gaps among adolescent girls despite high levels of awareness. This can be attributed to the fact that many schools especially mixed schools overlook the topic of proper menstrual hygiene predisposing them to inadequate detailed knowledge.

The predominance of parents (47.9%) and teachers (45.5%) as primary sources of information was positive since they are the primary mentors for the girls from childhood

to puberty going on which corroborates findings from (Singh et al., 2022). In Nigeria, researchers emphasize that familial and school-based education play pivotal roles in menstrual health knowledge in many African contexts. However, the relatively low role of peers and social media suggests limited alternative channels, possibly reflecting socio-cultural reticence to discuss menstruation among adolescents openly.

The significant variation in knowledge by school mirrors observations in a study by (Mudi et al., 2023) in India, where schools with comprehensive menstrual health programs had higher student knowledge scores. This suggests that school-specific interventions could be critical for improving menstrual literacy.

Attitudes towards menstruation

The finding that 52.9% of respondents had a positive attitude towards menstruation, while encouraging, indicates persistent stigma. Nearly half reported embarrassment when peers knew they were menstruating, consistent with global literature. For example, (Mudi et al., 2023) described how stigma and shame around menstruation are widespread in many settings and can negatively impact girls' self-esteem and school attendance. The belief by 21.4% that menstruation causes spiritual uncleanness reflects deep-seated cultural/religious taboos, similar to findings by (Budhathoki et al., 2018) in Nepal, where menstrual restrictions affected girls' participation in social and religious activities.

The avoidance of places of worship by 65.8% of respondents during menstruation aligns with cultural norms documented across many African and Asian societies, highlighting the intersection of menstrual health, spiritual, and cultural practices. Such restrictions were reported in (Chothe et al., 2014; Sahiledengle et al., 2022) work in India and Nepal, demonstrating how menstrual taboos contribute to social exclusion.

Menstrual hygiene Practices

The findings from this study align with broader patterns observed in Kenya and other low- and middle-income countries, where sanitary pads are the predominant menstrual product among adolescent girls. Similar to studies done by (Nyothach et al., 2015) In Nyanza and western Kenya, the high use of sanitary pads reflects improvements in availability and affordability, yet the continued use of inappropriate materials by a small percentage

highlights ongoing economic and access barriers. The vaginal hygiene practices observed, where a majority used only water and a significant proportion used soap and water, mirror the hygiene awareness disparities identified by (MacRae et al., 2019) suggesting the need for increased education on proper menstrual hygiene to prevent infections. Disposal methods were mostly safe, with the majority using pit latrines and bins; however, the 4.1% using open pits raises environmental health concerns, echoing challenges described in a study conducted in the informal settlements of Nairobi by (Winter et al., 2022) regarding menstrual waste management.

Encouragingly, the high proportion of girls changing pads in private rooms indicates good access to privacy, an important factor for dignity during menstruation and consistent with findings from Rossouw & Ross (. Water access at sanitation facilities was adequate for most but remains a challenge for 11% without an active water source, reflecting water scarcity issues highlighted by (Sommer et al., 2016).

Overall, while many menstrual hygiene practices were positive, gaps remain in product accessibility, hygiene education, waste disposal, and addressing cultural restrictions, consistent with global research findings as discussed.

CONCLUSION

This study reveals that although many adolescent girls in Lari Sub-County are aware of menstruation and menstrual hygiene, detailed knowledge and positive attitudes are not universal, and hygiene practices are constrained by persistent cultural stigma and limitations in water, sanitation, and hygiene (WASH) infrastructure. These findings underscore the interconnected nature of knowledge, social norms, and enabling environments in shaping menstrual health outcomes.

The substantial gaps in menstrual hygiene knowledge, particularly in specific schools, suggest that general awareness alone is insufficient. Targeted menstrual health education that equips girls with accurate information about menstrual physiology and hygienic practices is urgently needed. Given that parents and teachers are the primary sources of information, interventions should actively engage both groups as partners in education and dialogue, rather than relying solely on student-centered messaging.

Cultural misconceptions and stigma remain deeply rooted, affecting girls' confidence and participation in daily activities during menstruation. Addressing these barriers will require sustained community engagement and efforts to normalize conversations around menstruation within families, schools, and faith-based groups.

In addition to educational interventions, improvements in WASH infrastructure are critical. Reliable water supply, functional sanitation facilities, and private, safe spaces for menstrual management in schools are necessary conditions for hygienic practices to translate into everyday behavior. These priorities align with current UNICEF guidelines on menstrual hygiene management, which emphasize both knowledge and enabling environments.

RECOMMENDATIONS

Based on the findings, the study recommends:

1. Strengthening school-based menstrual health education programs that are comprehensive, culturally sensitive, and age-appropriate.
2. Supporting parents and teachers with training and resources to provide accurate and supportive menstrual health information.
3. Expanding access to affordable sanitary materials, including government or NGO provision of free or subsidized products for girls from low-resource households.
4. Improving school WASH infrastructure, ensuring consistent water availability, adequate sanitation, and private changing spaces for girls.

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