

# Challenges Associated with Menstrual Hygiene among Adolescent Girls Attending Bocharia Primary School in Nyamira County, Kenya

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## Abstract

**Background:** Approximately, half a million of adolescent girls in the world feel frustrated during their monthly period due to poor menstrual hygiene practices. In the low-and-middle income countries, about three-quarters of girls do not have access to clean sanitary materials, and use low-quality products. In the Sub-Saharan African countries, menstruation among school-age girls is a neglected issue. Poor menstrual hygiene practices expose adolescent girls to reproductive organ infections, psychosocial stress, and poor school attendance. However, the available data concerning challenges associated with menstrual hygiene among school girls in the remote areas of Kenya remains unknown. **Aim:** To assess challenges associated with menstrual hygiene among adolescent girls attending Bocharia Primary School in Nyamira County, Kenya. **Methods:** The target population was grade 4 to 8 adolescent girls (n = 111) aged 10 - 19 years. Hence, census method of sampling was used to include all the girls in grade 4 - 8. Raw data was obtained using a Semi-structured questionnaire which was tested by a representation of 11 girls (10% of the sample size) who had the same characteristics. Data was analyzed using SPSS version 21 with both descriptive and inferential statistics. In descriptive statistics, frequency and percentage were generated. The chi-square test of independence was used to determine associations between some socio-demographic variables of the girls and menstrual hygiene practice. A p-value of less than 0.05 was considered to be significant. **Results:** The study found that majority (57%) of the respondents had poor menstrual hygiene practices associated with lack of accessibility and affordability to sanitary products, functional and safe latrines, shortage of soap and water supply, and sanitation facilities. Approximately half (47.8%) of the respondents reported that menstrual hygiene practices are highly influenced by taboo from cultural beliefs and societal norms. Girls who live with both parents were

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more likely (73.3%) to wash their body with water and soap during monthly bleeding as compared to those girls from single mother (64.7%) and those who live or grand Mothers (42.9%). The toilets or latrines that were allocated to the girls were unlockable, which threatens privacy and safety of the girls.

**Conclusions:** Most of the school girls had poor menstrual hygiene practices associated with lack of sanitary products, safe and functional latrines, adequate water supply, soaps and sanitation facilities. Adequate attention to menstrual hygiene management should be given by the water, sanitation, and hygiene (WASH) program, education sectors, and sexual and reproductive health programs.

## Keywords

Kenya, Menstrual Hygiene, Menstrual Hygiene Practices

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## 1. Introduction

Menstruation is a cyclical discharging of blood, secretions, and tissue debris from the uterus that recurs on a monthly basis among reproductive-age girls and women [1]. Menstrual hygiene is defined as using clean materials to absorb menstrual blood, washing the body as needed with soap and water, and having access to amenities to dispose the used materials [2]. Approximately, half a million of adolescent girls in the world feel frustrated during their monthly period due to poor menstrual hygiene practices [3]. Most primary and secondary schools girls in the developing countries face challenges with enough water and soap for washing, separate lockable toilets, sanitary towels and disposal bins. This is complicated by ignorance of their menstrual needs by teachers, intimidation by boys and older girls, creating a stressful environment for school girls [4] [5] [6].

The magnitude of inappropriate management of menstrual hygiene is significantly higher among adolescent girls in developing countries compared to those in the developed world [7]. In the low-and-middle income countries, approximately 13% to 75% of girls do not have access to clean sanitary materials, and use low-quality products such as old clothes, cotton wools, toilet paper, sponges or underwear alone [8] [9] [10] [11]. For example, a study carried out in some of the Sub-Saharan African (SSA) countries indicated that most of adolescent girls reported a lack of safe, private, clean toilets and washing facilities at schools [11]. Lack of appropriate management of menstrual hygiene is also a major reason for absenteeism from school in the developing countries. A report by the United Nations International Children Emergency Fund (UNICEF) indicated that, 10% of school-age African girls do not attend school during menstruation [12]. Girls' inability to manage their monthly periods appropriately affect school attendance resulting in poor exam performance and drop outs [2] [6] [13] [14].

Most school toilets in the SSA countries are unimproved, unlocked and had

no soap and enough water supply contributing to a higher percentage of girls either do not change their menstrual clothes during school hours or miss classes [15]. A cross-sectional study in Ethiopia reported that poorly maintained toilets in schools affected menstrual hygiene practice as they are unlockable, lacked disposal bins and washing materials like soap and running water [16]. A study in Gambia showed that disposable sanitary towels were not available at schools, a major hindrance to the practice of appropriate menstrual hygiene [4]. In Tanzania it was revealed that girls discarded their sanitary towels in the dumping sites, flushed in water-borne system, burned in an open area. Others wrapped their used absorbent materials, carrying them to dispose at home due to social and cultural norms associated with it [17]. A study conducted in Nigeria showed that some teen-age girls used pieces of old clothes, sanitary napkins, tissue papers and tampons during their monthly bleeding [18].

In Kenya, most school girls used alternative materials as menstrual absorbents due to limited access to sanitary towels, lack of disposal bins and distant private changing areas. Approximately, two-third (65%) of Kenyan girls cannot afford sanitary towels, and only one-third (32%) of rural schools have private places for girls to change used materials [4] [5]. In the informal settlements of Nairobi, Kenya, girls did not want others to know that they were on menses, they hid their used sanitary towels in their bags or pockets instead of discarding them in provided disposal bins. In some Kenyan schools, there are no appropriate facilities, soap, running water, sufficient privacy, clean and lockable toilets [5] [6]. Another major consequence of poor menstrual hygiene management is decreased school attendance among Kenyan girls. If girls feel embarrassed or shameful about their period, they are much less likely to attend school while menstruating. Furthermore, girls often do not have appropriate sanitation facilities where they can manage their menstrual flow at school, potentially leading to a decrease in educational attendance [19].

In summary, most adolescent girls particularly in the SSA region fall into unhealthy practices of menstrual hygiene which include use of inappropriate menstrual absorbents like toilet papers, old pieces of clothes and dried leaves; improper disposal of stained menstrual materials [2] [6] [13] [14]. Poor menstrual hygiene practices expose adolescent girls to reproductive organ infections, psychosocial stress, and poor school attendance. School girls suffer from lack of concentration and participation during class sessions associated with discomfort and shame during menstruation [20] [21]. UNICEF estimates that 1 in 10 school-age African girls do not attend school during menstruation, and the World Bank statistics estimates absences to be approximately four days every four weeks [19].

Despite the evidence that girls in the SSA countries are disproportionately burdened with poor menstrual hygiene practices, menstrual hygiene has not received adequate attention in these countries, and there is a lack of adequate data to inform policy makers. Therefore, the aim of the study was to evaluate menstrual hygiene practice and associated factors among adolescent girls attending

Bocharia Primary School in Nyamira County, Kenya.

## **2. Methods and Materials**

### **2.1. Study Setting**

Bocharia Primary school is located in Kitutu Masaba Constituency, East Kitutu Location, and Rigoma Division within the Nyamira District of Nyamira County in the Nyanza Province of Kenya. It is a day school for ordinary boys and girls and learning is carried out through a Kenyan Curriculum. The inhabitants of this region are Kisii by tribe whose main economic activities include mixed farming and small scale business activities. The main religion is Christianity as illustrated in the map of Kitutu Masaba Constituency in Nyamira County.

### **2.2. Study Design, Sampling, and Respondents**

This was a descriptive, cross-sectional study design carried out among adolescent girls aged 10 - 19 years attending Bocharia Mixed Primary School in the year 2020. The main participants were adolescent girls in the age bracket of 10 to 19 years studying at Bocharia Mixed primary school in grade four to class eight. According to the statistics in the school, there were 31 girls in class four, 26 girls in class Five, 20 girls in class Six, 20 girls in class Seven and 14 girls in class eight bringing the target population to 111 girls. Census method was used to include all the 111 girls in grade 4 to class 8 because the population was small. Girls in grade four to class eight who were aged between 10 to 19 years included into the study. Girls aged 10 to 19 years who were not present at the time of data collection were excluded from the study.

### **2.3. Data Collection**

The data were collected using semi structured questionnaires. The assessment comprised socio-demographic of the girls, practice of menstrual hygiene, availability and affordability of menstrual hygiene materials. Observation check list was also used to check for availability of facilities that support menstrual hygiene practice at the primary school. The questionnaire was developed by the researcher after reviewing and analyzing relevant literature review.

### **2.4. Validity and Reliability of the Study Tool**

Experts in the field of reproductive health revised the validity of the tools in terms of content, and their comments were incorporated into the final questionnaire. After two weeks, a test-retest technique was used to gauge the questionnaire's dependability. The Cohen's kappa coefficient was used to gauge how well the two results agreed with one another. A reliable kappa value of 0.82 was obtained from the repeated questions.

### **2.5. Ethical Consideration**

This study was conducted under strict observation of all the ethical guidelines.

Ethical approval to conduct this study was obtained from Kenyatta National Hospital-University of Nairobi Ethical Review Committee (KNH-UoN ERC) (Approval number: UP232/04/2020). Research permit was granted from National Commission for Science and Innovations (NACOSTI) (License number: NACOSTI/P/20/5435). The institutional permission was granted by the administration of the school. Prior to administering the questionnaires, informed consent was obtained from the respondents to certify that their participation was voluntary. They were all below 18 years, hence the parents or guardian signed the consent before taking part in the study. Confidentiality was assured and the particular reason for the study was made clear. The study ensured no harm to all participants as a result of the findings.

## 2.6. Data Analyses

Statistical analyses were performed using the statistical package for the Social Sciences (SPSS: version 21). Data were descriptively analyzed into frequencies and proportions. The chi-square test of independence was used to determine associations between some socio-demographic variables of the girls and menstrual hygiene practice. A p-value of less than 0.05 was considered to be significant.

## 3. Results

### 3.1. Socio-Demographic Information of the Respondents

**Table 1** below presents the socio demographic information of the respondents. Almost half, (48%, n = 44) of the respondents were in the age group of 14 - 16 years. Most (78%, n = 72) of the girls were staying with both parents. Majority (58%, n = 53) of their parents/guardians were farmers. Approximately, a quarter (23.9%, n = 22) were grade eight.

### 3.2. Menstrual Hygiene Preferences and Practices (n, %)

**Table 2** presents menstrual hygiene practices among the school girls. Majority (78.3%, n = 72) of the respondents strongly agreed that they preferred sanitary towels. Most (72.8%, n = 67) of the girls stated that it is crucial to use soap and water to wash their bodies during the menstrual period. Majority of the girls reported that it is essential to change the menstrual absorbents 3 - 4 times a day (64.1%, n = 59) and dispose them in pit latrines (92.4%, n = 85). However, many (47.8%, n = 44) agreed that menstrual hygiene practices were highly influenced by taboo from cultural beliefs but they were undecided (48.9%, n = 45) when they were asked to make judgment concerning wrong disposal of used menstrual materials even though majority (92.4%, n = 85) selected pit latrines as places of disposal.

### 3.3. Material Used for Menstrual Hygiene

A good number (43.5%, n = 40) of the girls used sanitary towels for menstrual

**Table 1.** Social-demographic information of the respondents.

Characteristics	frequency	percentage
<b>Age (years)</b>		
≤13	38	41
14 - 16	44	48
≥16	10	11
<b>Total</b>	<b>92</b>	<b>100</b>
<b>Birth Order</b>		
≤4 <sup>th</sup> Born	71	77.2
5 <sup>th</sup> - 9 <sup>th</sup> Born	21	22.8
<b>Total</b>	<b>92</b>	<b>100</b>
<b>Parents/Guardian</b>		
Mother	17	19
Father and Mother	72	78
Grand Mother	3	3
<b>Total</b>	<b>92</b>	<b>100</b>
<b>Grade level</b>		
Grade 4	20	21.7
Grade 5	18	19.6
Grade 6	19	20.7
Grade 7	13	14.1
Grade 8	22	23.9
<b>Total</b>	<b>92</b>	<b>100</b>
<b>Occupation of Parents/Guardian</b>		
Farming	53	58
Business	17	18
Civil servant	10	11
Others	12	13
<b>Total</b>	<b>92</b>	<b>100</b>

absorbents. Nearly one quarter (20.7%) of the girls used cotton wools, while others used alternatives (**Figure 1**).

### 3.4. Places of Disposal for Used Menstrual Material

**Figure 2** below shows that majority (92.4%) of the respondents disposed their used menstrual material in pit latrines. Others (6.5%) burn them in open spaces.

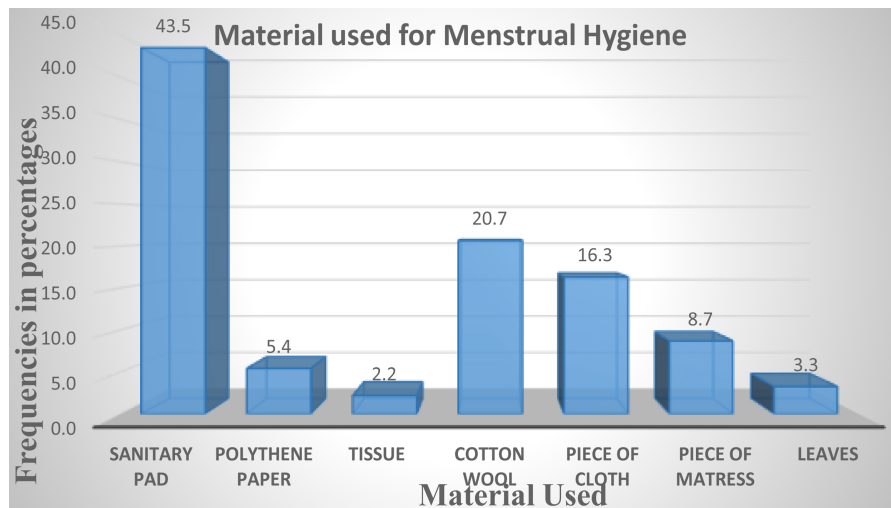
### 3.5. Affordability of Proper Menstrual Hygiene Materials

**Figure 3** below presents the response of the respondents concerning affordability

**Table 2.** Menstrual hygiene preferences and practices (n, %).

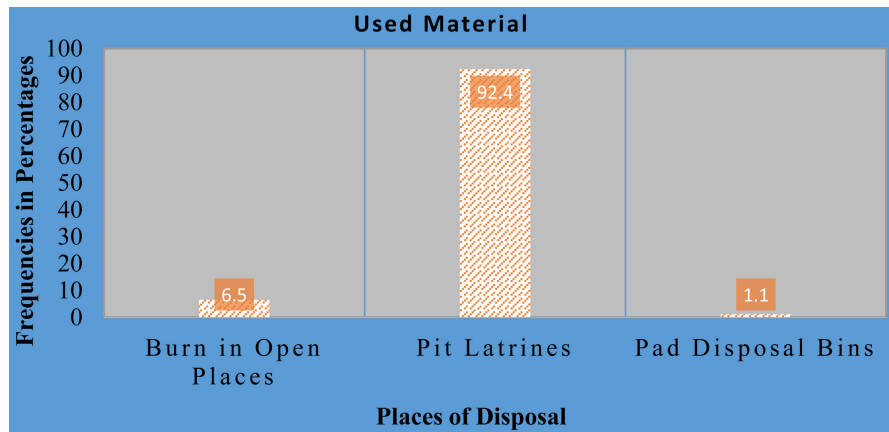
The practice of Menstrual Hygiene	SA	A	U	D	SD	Total
Sanitary towels are the most preferred materials to absorb menstrual blood.	72 (78.3)	16 (17.4)	4 (4.3)	0 (0.0)	0 (0.0)	92 (100)
Menstrual hygiene practices are highly influenced by taboo from cultural beliefs.	21 (22.8)	44 (47.8)	20 (21.7)	6 (6.5)	1 (1.1)	92 (100)
It is important to use soap and water to wash during the menstrual period.	67 (72.8)	24 (26.1)	1 (1.1)	0 (0.0)		92 (100)
It is necessary to change the menstrual absorbents 3 - 4 times a day.	59 (64.1)	29 (31.5)	3 (3.3)	0 (0.0)	1 (1.1)	92 (100)
Most girls dispose used menstrual materials wrongly.	10 (10.9)	21 (22.8)	45 (48.9)	13 (14.1)	3 (3.3)	92 (100)

KEY: SA—Strongly Agree, A—Agree, U—Undecided, SD—Strongly Disagree, D—Disagree.

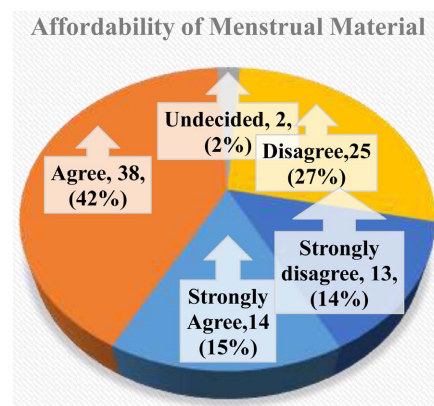


**Figure 1.** Materials used as menstrual absorbents.

of proper menstrual Hygiene materials. Of the respondents, a higher proportion (42%, n = 38) agreed, and some (15%, n = 14) strongly agreed that they could not afford menstrual Hygiene materials. About one fourth (27%, n = 25) of the respondents) disagreed that they could not afford menstrual Hygiene materials.



**Figure 2.** Disposal of used menstrual absorbents.



**Figure 3.** Affordability of proper menstrual hygiene materials.

### 3.6. Availability of Soap and Water for Proper Menstrual Hygiene Management

The study findings indicate that 22%, ( $n = 20$ ) and (28%,  $n = 26$ ) of the respondents strongly agreed and agreed, respectively, that they don't have soap and water for washing hands after using or changing the menstrual materials at the school (**Figure 4**).

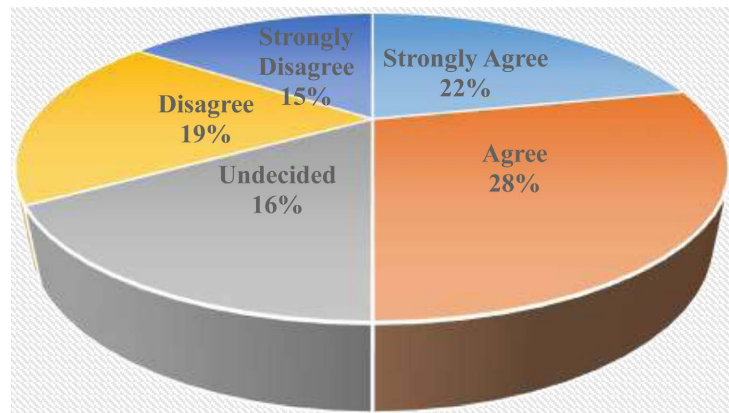
### 3.7. Observation Check List

There were four (4) unlockable and separate latrines to serve all the girls from grade 1 to 8. There was no running water and soap near the latrines for washing hands after using or changing the menstrual materials. Some sanitary towels were available in the school office. However, there was no disposal bins, and the girls threw the used menstrual absorbents in the latrines. Moreover, no girl was putting on a stained dress.

### 3.8. Association between Respondents' Socio-Demographics and Menstrual Hygiene Practice

**Table 3** below presents some of the girls' socio-demographic variable in relation





**Figure 4.** Availability of soap and water for proper menstrual hygiene management.

**Table 3.** Socio-demographics of the respondents associated with menstrual hygiene practice.

Variables	Frequency of changing Menstrual Absorbents (n, %)		Total	Chi	df	P-Value
	≥3 times per day	<3 times per day				
<b>Age (years)</b>						
≤13	21 (55.3%)	17 (44.7)	38 (100%)	2.150*		0.36
14 - 16	20 (5.5%)	24 (54.5%)	44 (100%)			
≥16 years	3 (30.0%)	7 (70.0%)	10 (100%)			
Total	44 (47.8)	48 (52.2)	92 (100.0)			
	Washing with Soap and Water during monthly bleeding (n, %)					
<b>Living arrangements</b>	Yes	No				
Live with Mother	11 (64.7%)	6 (35.3%)	17 (100%)	5.020	2	0.85
Live with both Father and Mother	45 (73.3%)	16 (26.2%)	61 (100%)			
Grand Mother	6 (42.9%)	8 (57.1%)	14 (100%)			
Total	62 (67.4)	30 (32.6)	92 (100.0)			
	Use Sanitary Towels during monthly bleeding (n, %)					
<b>Grade in School</b>	Yes	No				
Grade 4	19 (95%)	2 (5.3%)	21 (100%)	9.490	4	0.05
Grade 5	11 (61.1%)	7 (38.9%)	18 (100%)			
Grade 6	12 (63.2%)	7 (36.8%)	19 (100%)			
Grade 7	10 (83.3%)	2 (16.7%)	12 (100%)			
Grade 8	13 (59.1%)	9 (40.9%)	22 (100%)			

to menstrual hygiene practice. Girls aged below 14 years were more frequently (55.3%) to change their menstrual absorbents as compared to those girls aged 14 years and above, however, the difference was not statically significant. Girls who

live with both parents were more likely (73.3%) to wash their body with water and soap during monthly bleeding as compared to those girls who live with their Mothers (64.7%) or with grand Mothers (42.9%). Preference of using sanitary towels during monthly bleeding was more common ( $P = 0.05$ ) among the girls in grade four and grade seven compared to those girls in grade five, six, and eight.

#### 4. Discussion

Our findings show that majority of the respondents had poor menstrual hygiene management practices associated with lack of accessibility and affordability to sanitary products, functional and safe latrines, running water supply, soaps and sanitation facilities. The girls cannot afford pads, they often resort to unsanitary methods in order to manage their periods. Substitutes for pads and tampons include easily accessible materials such as newspapers, cotton gauze, cloth strips, and leaves. Consistent with our findings, research revealed that, when Kenyan girls cannot afford pads, they often use alternative materials as menstrual absorbents such as newspapers, corn cobs, cotton gauze, cloth strips, or even old rags, leaves, or cow dung [22] [23]. Not only can these substitutes be less comfortable than pads or tampons, but they also are less absorbent and sterile, predispose them to distress and urinary tract infections [19]. This was consistent with a finding from a systematic review and meta-analysis conducted among adolescent girls in sub-Saharan Africa [24]. Indeed, poor menstrual hygiene practices affect the health of millions of adolescent girls in developing countries [25]. Lack of accessibility and affordability to sanitary products, functional latrines, and continuous water supply and sanitation facilities are common challenges in the developing countries [26] [27] [28] [29].

Approximately half of the respondents reported that menstrual hygiene practices are highly influenced by taboo due to social norms and cultural beliefs associated with it. Considering menstruation as a taboo could lead to fear and shame in discussions with other families and reduces young girls' knowledge about menstrual hygiene practices [30] [31]. In 2014, only 50% of Kenyan women and girls reported that they openly discuss menstruation at home, and only 12% of girls said that they would be comfortable receiving menstrual information from their mother [32]. The culture surrounding menstruation in Kenya contributes to inadequate menstrual hygiene management, because the perceptions and stigmas do not support open conversation regarding the topic [19]. In Kenya, menstruation is rarely discussed in families [22] and many girls reported feeling like they could not openly discuss menstruation at home because "it is too private to even share with their mother" [33]. Hence, there is a need to call for more open conversation surrounding menstruation.

The study findings indicate that half of the respondents agreed that they lacked soap and running water for washing hands after using or changing the menstrual materials at the school, leading to poor menstrual hygiene practice. In line with our findings, a study carried out in Kajiado County, Kenya, found that

most primary and secondary school girls had limited supplies of sanitary pads, lack of running water which affected hand washing and daily bathing during menstruation days [5]. Similarly, studies showed that lack of access to clean and effective absorbents, facilities to change, disposal of absorbents, soap, water, and privacy are associated with poor menstrual hygiene practice [20] [34]. In a 2014 study of 62 primary schools in Kenya, researchers found that 60% had water for hand washing, but only 2% had soap [35]. Poor menstrual hygiene practices expose adolescent girls to genital-urinary tract infections, psychosocial stress associated with embarrassment, and reduced opportunities for accessing school [20] [21]. Furthermore, school girls suffer from lack of concentration and participation during class sessions associated with discomfort and shame during menstruation [26] [36].

The study revealed that, girls from single parents and those who live with grandparents were more likely to have poor menstrual hygiene practices as compared to those girls who live with both parents. Certainly, girls who live with both parents are more likely to have access and afford to buy sanitary napkins. In contrast, girls from single parents lack access to menstrual hygiene facilities, and the cost of sanitary products, main barriers to good menstrual hygiene practices during menstruation [37]. Lack of menstrual hygiene materials definitely affect hand washing and daily bathing practice during menstruation days. These barriers to adequate menstrual hygiene management create adverse consequences for the Kenyan girls, including infections, poor mental well-being, decreased education attainment, and gender inequality [19]. A similar study conducted in Ethiopia discovered that girls who stayed with both parents new how to manage their menstruation appropriately compared to those who stayed with a single parents and relatives [38]. This could be attributed to the emotional and social support the girls received from both parents.

In the current study, there was no soap and running water near the latrines for washing hands after using or changing the menstrual materials. There was no disposal bins, and the girls threw the used menstrual absorbents in the latrines. Consistent with our findings, studies performed in Nambale and Kisii township, Kenya, reported that most of the girls disposed their used sanitary products in pit latrines [39] [40]. The finding of the current study also showed that toilets that were allocated to the girls were ununlockable, which threatens privacy and safety of the girls. This was consistent with a study carried out in Kajiado County, Kenya, which found that the girls' washrooms were unlocked and therefore inconvenient to use by these girls during menstruation [5]. Studies conducted in rural Kenya revealed that approximately a quarter (32%) of schools had a private place for girls to change their sanitary products [5], and only 33% of these toilet rooms had locks [35]. Consistent with our findings, in a study carried out in 2014 among 62 primary schools in Kenya, it was found that girls frequently did not have a place to dispose of their used sanitary products and almost a fourth of girls reported carrying the used pads home or burning them in a garbage pit because they did not have access to a sanitary place to dispose it [19].

## 5. Study Limitations

The study was carried out in one primary school and all the participants were all from Nyamira County, Kenya. Generalizability to other counties of Kenya may not be possible.

## 6. Conclusions

The main factors associated with poor menstrual hygiene practices are lack of safe and affordable menstrual hygiene materials, inadequate sanitation and washing facilities, culture and negative social norms surrounding menstruation. Lack of menstrual hygiene materials can lead girls to turn to means such as old rags, leaves, newspapers, cotton gauze, old clothes, and leaves in order to manage their period. These unhygienic substitutes can have serious health consequences such as fungal infections, reproductive and urinary tract infections. The findings suggest that there is a lack of discussion surrounding menstruation which limits girls' understanding and comfort surrounding periods. Hence, there is a need for more open conversation surrounding menstruation.

School administration should establish programs to create more awareness to all the adolescent girls about menstruation and encourage consistency in the menstrual hygiene management, support parents and teachers to transfer facts of menstruation. The school administration should also sensitize parents to take the lead in educating their daughters on menstrual hygiene and increase the number of disposal sanitary towels given to the pupils. County Education and Health Sector to collaborate in ensuring all the schools are equipped with adequate WASH facilities that support privacy and cleanliness of the adolescent girls during their menstrual periods.

## Authors' Contribution

Tekeste and Martha conceptualized the research problem, research question, design the study protocol and involved in proposal writing. Data collection and entry were performed by Martha. Tekeste carried out data analysis, interpretation and manuscript preparation. Martha revised the manuscript.

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## Conflicts of Interest

None of the authors had a conflict of interest with regards to this publication.

## References

- [1] Winkler, I.T. and Roaf, V. (2014) Taking the Bloody Linen out of the Closet: Menstrual Hygiene as a Priority for Achieving Gender Equality. *Cardozo JL & Gender*, **21**, 1.

- [2] Kaur, R., Kaur, K. and Kaur, R. (2018) Menstrual Hygiene, Management, and Waste Disposal: Practices and Challenges Faced by Girls/Women of Developing Countries. *Journal of Environment and Public Health*, **2018**, Article ID: 1730964. <https://www.hindawi.com/journals/jep/2018/1730964>  
<https://doi.org/10.1155/2018/1730964>
- [3] World Bank Group (2018) Menstrual Hygiene Management Enables Women and Girls to Reach Their Full Potential. <https://www.worldbank.org/en/news/feature/2018/05/25/menstrual-hygiene-management>
- [4] Shah, V., Helen, M., Nabwera, H.M., Sosseh, F., Jallow, Y., Comma, E., Keita, O. and Torondel, B. (2019) Knowledge, Preparedness and Practices of Menstruation and Its Management among Adolescents, Mothers and Teachers in the Rural Gambia. *BMC Public Health*, **19**, Article No. 277. <https://bmcpublihealth.biomedcentral.com/track/pdf/10.1186/s12889-019-6599-2>  
<https://doi.org/10.1186/s12889-019-6599-2>
- [5] Korir, E., Okwara, F.N. and Okumbe, G. (2018) Menstrual Hygiene Management Practices among Primary School Girls from a Pastoralist Community in Kenya. *The Pan African Medical Journal*, **31**, Article No. 222. <http://www.panafrican-med-journal.com/content/article/31/222/full/>  
<https://doi.org/10.11604/pamj.2018.31.222.13521>
- [6] Girod, C., Ellis, A., Karen, L.K., *et al.* (2017) Physical, Social, and Political Inequities Constraining Girls' Menstrual Management at Schools in Informal Settlements of Nairobi, Kenya. *Journal of Urban Health*, **94**, 835-846. [https://menstrualhygieneday.org/wp-content/uploads/2017/09/Girod\\_et\\_al-Girls-constraints\\_Kenya\\_2017.pdf](https://menstrualhygieneday.org/wp-content/uploads/2017/09/Girod_et_al-Girls-constraints_Kenya_2017.pdf)
- [7] Sommer, M., Caruso, B.A., *et al.* (2016) A Time for Global Action: Addressing Girls' Menstrual Hygiene Management Needs in Schools. *PLOS Medicine*, **13**, e1001962. <https://doi.org/10.1371/journal.pmed.1001962>
- [8] Enzler, D.M. (2019) Knowledge, Attitudes and Practices Concerning Menstrual Hygiene Management (MHM) of Adolescents in Rural Primary Schools in Malawi.
- [9] Fisseha, M.A., Kebede, Y., *et al.* (2017) Menstrual Hygiene Practice and Associated Factors among Secondary School Girls in Wegera District, Northwest Ethiopia; a Cross-Sectional Study. *Computational Biology and Bioinformatics*, **5**, 6-11. <https://doi.org/10.11648/j.cbb.20170501.12>
- [10] Kuhlmann, A.S., Henry, K., *et al.* (2017) Menstrual Hygiene Management in Resource-Poor Countries. *Obstetrical & Gynecological Survey*, **72**, 356-376. <https://doi.org/10.1097/OGX.0000000000000443>
- [11] Tamiru, S., Mamo, K., *et al.* (2015) Towards a Sustainable Solution for School Menstrual Hygiene Management: Cases of Ethiopia, Uganda, South-Sudan, Tanzania, and Zimbabwe. *Waterlines*, **34**, 92-102. <https://doi.org/10.3362/1756-3488.2015.009>
- [12] Education, P. Menstrual Hygiene Management (2014) UNESCO Digital Library. United Nations Educational, Scientific and Cultural Organization, Paris.
- [13] Murye, A.F. and Mamba, S.R. (2017) Practices of Managing Menstrual Hygiene by Girls in Public Boarding Secondary Schools—The Case of the Hhohho Region of Swaziland. *Health Science Journal*, **11**, Article No. 534. <http://www.hsj.gr/medicine/practices-of-managing-menstrual-hygiene-by-girls-in-public-boarding-secondary-schools--the-case-of-the-hhohho-region-of-swaziland.php?id=21411>  
<https://doi.org/10.21767/1791-809X.1000534>
- [14] Deshpande, T.N., Patil, S.S., Gharai, S.B., Patil, S.R. and Durgawale, P.M. (2018)

- Menstrual Hygiene among Adolescent Girls—A Study from the Urban Slum Area in India. *Journal of Family Medicine and Primary Care*, **7**, 1439-1445. <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6293884/> [https://doi.org/10.4103/jfmpc.jfmpc\\_80\\_18](https://doi.org/10.4103/jfmpc.jfmpc_80_18)
- [15] Alam, M., Luby, S.P., Halder, A.K., Islam, K., Opel, A., Shoab, A.K., Ghosh, P.K., Rahman, M., Mahon, T. and Unicomb, L. (2016) Menstrual Hygiene Management among Bangladeshi Adolescent Schoolgirls and Risk Factors Affecting School Absence. *BMJ Journals*, **7**, e015508. <https://doi.org/10.1136/bmjopen-2016-015508>
- [16] Shallo, S.A., Willi, W. and Abubekar, A. (2018) Menstrual Hygiene Management Practice and Factors Affecting It among High School Females in Ambo City, Oromia State, Ethiopia, 2018: A Cross-Sectional Mixed Method. 1-26. <https://www.biorxiv.org/content/10.1101/806422v1.full>
- [17] Guya, E., Mayo, A.W. and Kimwaga, M.K. (2014) Menstrual Hygiene Management in Secondary Schools in Tanzania. Descriptive Cross-Sectional Study Design. *International Journal of Science and Technology*, **3**, 27-40.
- [18] Aluko, O.O., Oluya, O.M., Olaleye, O.A., Olajuyin, A.O., Olabintan, T.F. and Oloruntoba-Oju, O.I. (2014) Knowledge and Menstrual Hygiene Practices among Adolescents in Senior Secondary Schools in Ile Ife, South-Western Nigeria. *Journal of Water, Sanitation and Hygiene for Development*, **4**, 248-256. <https://doi.org/10.2166/washdev.2014.084>
- [19] Sampson, K. (2019) Menstrual Hygiene Management among Adolescent Girls in Kenya. Ballard Brief. <https://www.ballardbrief.org>
- [20] Phillips-Howard, P.A., Caruso, B., *et al.* (2016) Menstrual Hygiene Management among Adolescent Schoolgirls in Low-n and Middle-Income Countries: Research Priorities. *Global Health Action*, **9**, Article No. 33032. <https://doi.org/10.3402/gha.v9.33032>
- [21] Mathiyalagen, P., Peramasamy, B., *et al.* (2017) A Descriptive Cross-Sectional Study on Menstrual Hygiene and Perceived Reproductive Morbidity among Adolescent Girls in a Union Territory, India. *Journal of Family Medicine and Primary Care*, **6**, 360-365. <https://doi.org/10.4103/2249-4863.220031>
- [22] Njeri Ngugi, M. and Nyaura, J.E. (2014) Demystifying the Menstruation Process among the Kenyan Girl-Child “A Period of Shame”: A Socio-Cultural Perspective. *International Journal of Science and Research*, **3**, 1077-1083. <https://www.ijsr.net/archive/v3i10/MDMwOTE0MDQ%3D.pdf>
- [23] Tellier, S. and Hyttel, M. (2017) Menstrual Health Management in East and Southern Africa: A Review Paper: Menstrual Health Management Symposium.
- [24] Anbesu, E.W. and Asgedom, D.K. (2023) Menstrual Hygiene Practice and Associated Factors among Adolescent Girls in Sub-Saharan Africa: A Systematic Review and Meta-Analysis. *BMC Public Health*, **23**, Article No. 33. <https://doi.org/10.1186/s12889-022-14942-8>
- [25] Bairwa, M., Rajput, M., *et al.* (2013) Modified Kuppuswamy’s Socioeconomic Scale: Social Researcher Should Include Updated Income Criteria, 2012. *Indian Journal of Community Medicine*, **38**, 185-186. <https://doi.org/10.4103/0970-0218.116358>
- [26] Hennegan, J., Dolan, C., *et al.* (2016) Measuring the Prevalence and Impact of Poor Menstrual Hygiene Management: A Quantitative Survey of Schoolgirls in Rural Uganda. *BMJ*, **6**, e012596. <https://doi.org/10.1136/bmjopen-2016-012596>
- [27] Cardoso, L.F., Clark, C.J., *et al.* (2019) Menstrual Restriction Prevalence and Association with Intimate Partner Violence among Nepali Women. *BMJ Sexual & Reproductive Health*, **45**, 38-43. <https://doi.org/10.1136/bmjshr-2017-101908>

- [28] Chandra-Mouli, V. and Patel, S.V. (2020) Mapping the Knowledge and Understanding of Menarche, Menstrual Hygiene and Menstrual Health among Adolescent Girls in Low- and Middle-Income Countries. In: Bobel, C., *et al.*, Eds., *The Palgrave Handbook of Critical Menstruation Studies*, Springer, Berlin, 609-636. [https://doi.org/10.1007/978-981-15-0614-7\\_46](https://doi.org/10.1007/978-981-15-0614-7_46)
- [29] Ivanova, O., Rai, M., *et al.* (2019) A Cross-Sectional Mixed-Methods Study of Sexual and Reproductive Health Knowledge, Experiences and Access to Services among Refugee Adolescent Girls in the Nakivale Refugee Settlement. *Uganda Reproductive Health*, **16**, Article No. 35. <https://doi.org/10.1186/s12978-019-0698-5>
- [30] Chothe, V., Khubchandani, J., *et al.* (2014) Students' Perceptions and Doubts about Menstruation in Developing Countries: A Case Study from India. *Health Promotion Practice*, **15**, 319-326. <https://doi.org/10.1177/1524839914525175>
- [31] Sommer, M., Sutherland, C., *et al.* (2015) Putting Menarche and Girls into the Global Population Health Agenda. *Reproductive Health*, **12**, 1-3. <https://doi.org/10.1186/s12978-015-0009-8>
- [32] Facility Solutions Group (2016) Menstrual Health in Kenya; Country Landscape Analysis. [https://menstrualhygieneday.org/wp-content/uploads/2016/04/FSG-Menstrual-Health-Landscape\\_Kenya.pdf](https://menstrualhygieneday.org/wp-content/uploads/2016/04/FSG-Menstrual-Health-Landscape_Kenya.pdf)
- [33] Mason, L., Nyothach, E., Alexander, K., Odhiambo, F.O., Eleveld, A., Vulule, J., *et al.* (2013) "We Keep It Secret So No One Should Know"—A Qualitative Study to Explore Young Schoolgirls Attitudes and Experiences with Menstruation in Rural Western Kenya. *PLOS ONE*, **8**, e79132. <https://doi.org/10.1371/journal.pone.0079132>
- [34] Asumah, M.N., Aninanya, G.A., Salisu, W.J., *et al.* (2022) Perceived Factors Influencing Menstrual Hygiene Management among Adolescent Girls: A Qualitative Study in the West Gonja Municipality of the Savannah Region, Ghana. *Pan African Medical Journal*, **41**, Article No. 146. <https://doi.org/10.11604/pamj.2022.41.146.33492>
- [35] Alexander, K.T., Oduor, C. and Nyothach, E. (2014) Water, Sanitation and Hygiene Conditions in Kenyan Rural Schools: Are Schools Meeting the Needs of Menstruating Girls? *Water*, **1**, 1453-1466. <https://doi.org/10.3390/w6051453>
- [36] Boosey, R., Prestwich, G., *et al.* (2014) Menstrual Hygiene Management amongst Schoolgirls in the Rukungiri District of Uganda and the Impact on Their Education: A Cross-Sectional Study. *The Pan African Medical Journal*, **19**, Article No. 253. <https://doi.org/10.11604/pamj.2014.19.253.5313>
- [37] Omidvar, S. and Begum, K. (2010) Factors Influencing Hygienic Practices during Menses among Girls from South India—A Cross Sectional Study. *International Journal of Collaborative Research on Internal Medicine & Public Health*, **2**, 411-423.
- [38] Gultie, T., Hailu, D. and Workineh, Y. (2014) Age of Menarche and Knowledge about Menstrual Hygiene Management among Adolescent School Girls in Amhara Province, Ethiopia: Implication to Health Care Workers & School Teachers. *PLOS ONE*, **9**, e108644. <https://doi.org/10.1371/journal.pone.0108644>
- [39] Otwani, C. and Juma, D. (2015) Determinants of Menstrual Hygiene among Primary School Girl Projects in Namable Division of Busia County, Kenya. *International Journal of Scientific Engineering and Research*, **5**, 105-113.
- [40] Higgins, A. (2018) Having a Period Is Unaffordable in Kenya, Yet No One Wants to Talk about It. <https://www.theguardian.com/global-development-professionalsnetwork/2017/jan/05/having-a-period-is-unaffordable-in-kenya-yet-no-one-wants-to-talk-about-it>