# Association Between Knowledge Levels and Menstrual Hygiene Management Practices among Adolescent Girls with Disabilities in Selected Schools in Wajir County, Kenya

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## Abstract

**BACKGROUND**

**Menstruation marks a significant transition for adolescent girls, yet unhygienic practices and inadequate access to clean and supportive environments, like sanitation facilities, impact their social well-being and health. This issue is exacerbated for girls with disabilities due to the additional challenges they face. This study aimed to assess Menstrual Hygiene Management (MHM) practices among adolescent girls with disabilities in primary schools in Wajir County, Kenya, focusing on knowledge level.**

**METHODOLOGY**

**A descriptive cross-sectional study design was employed, using a census sampling technique to select 101 adolescent girls with disabilities from three primary schools. Data was collected through questionnaires and analyzed using descriptive and inferential statistics. Chi-square tests determined associations between variables, with significant results further examined through logistic regression analysis.**

**RESULTS**

**Only 11.9% of respondents practised MHM. Knowledge factors that were associated with Menstrual Hygiene Management practice were; normal for every girl to experience menstruation (p=0.013), Menstrual blood comes from the womb (p=0.042), Menstruation is an indication of fertility (p=0.008) and overall level of knowledge about menstruation (p=0.037). Predictors of Menstrual Hygiene Management practice were, believing it is normal for every girl to experience menstruation (AOR=7.417, p=0.001), menstruation is an indicator of fertility (AOR=6.800, p=0.045) and overall levels of menstrual knowledge (AOR=4.206, p=0.028).**

**CONCLUSION AND RECOMMENDATIONS**

**Menstrual Hygiene Management (MHM) practices among the study population were notably low. Overall level of knowledge predicted Menstrual Hygiene Management practice (AOR=4.206, p=0.028). We recommend providing free sanitary pads, improving sanitation facilities, addressing misconceptions, and increasing MHM education. Enhanced support from the government and NGOs is crucial to improve access to resources and services.**

***Keywords**: Knowledge, Menstrual Hygiene Management Practices, Adolescent Girls, Disabilities, Wajir County, Kenya*

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## Introduction

Menstruation, the regular shedding of the uterine lining, is a natural and essential process for girls and women of reproductive age. Despite its universality, menstruation often presents significant challenges, particularly for adolescent girls in both developed and developing countries [1]. Proper menstrual

hygiene is crucial for managing menstruation effectively and comfortably. However, a substantial gap persists in knowledge and resources related to menstrual practices, the availability of menstrual products, and societal support, especially in underserved communities.

Menstrual Hygiene Management (MHM) is a vital aspect of health and well-being for women and adolescent girls, yet it remains largely neglected, particularly for those with disabilities [2]. In school environments, MHM challenges are compounded by poor sanitation, limited education on menstrual health, lack of privacy, and stigmatization rooted in cultural norms [3]. The Ministry of Health [4] identifies the inadequacy of MHM guidance, poor water quality, and insufficient infrastructure in many schools as key factors that limit girls' ability to maintain safe and proper hygiene during menstruation.

The absence of proper sanitation facilities and privacy in schools leads to high rates of absenteeism and dropout among girls. For instance, a study in Gambia found that 27% of girls missed at least one school day per month due to menstruation [5]. Other studies have highlighted infrastructure deficits, such as the lack of facilities for changing, cleaning, and disposing of menstrual products, as well as privacy concerns, as significant barriers to effective MHM [6]. The stigma surrounding menstruation and the lack of social support exacerbate these challenges, negatively impacting the physical and mental health, social status, and overall quality of life for women [7].

The situation is even more severe for girls and women with disabilities, who face unique challenges in managing menstruation with dignity. These challenges often differ from those experienced by others and require specialized attention [8,9]. Adolescents with disabilities may exhibit behaviors such as agitation and hyperactivity, which can hinder the adoption of better menstrual management practices [10] The lack of proper MHM often leads to social isolation, shame, and even forced sterilization for these girls [11]. In regions like Wajir County, where adolescent girls remain underprivileged due to resource scarcity and a semi-nomadic lifestyle, the issue of MHM remains critically underexplored [12]. This study aimed to investigate the association between the level of knowledge and Menstrual Hygiene Management practices among adolescent girls with disabilities in selected schools in Wajir County.

## Materials and Methods

### Study design, Setting and Participants

The study adopted a descriptive cross-sectional research approach [13]. It was conducted in Wajir County, Kenya, targeting adolescent girls with disabilities enrolled in three selected primary schools. Wajir County was purposively selected because it is among the counties in northern Kenya with the highest rates of school absenteeism due to poor menstrual hygiene management [12]. The following three selected schools were also purposively chosen due to their high enrollment of girls with disabilities [13]: Wajir Girls' Primary School, Wajir Catholic Primary School, and Wajir School for the Deaf. All school-going adolescent girls aged 11-19 years with disabilities whose parents or guardians consented to their participation, were included in the study. Severely ill girls and those unable to obtain consent were excluded.

**Table 1:**
*Study Site Sampling frame*

| Schools | Number of adolescent girls with disabilities |
|---|---|
| Wajir Catholic Primary School | 24 |
| Wajir Deaf School | 33 |
| Wajir Girls Primary School | 74 |
| Total | 131 |

## Sampling Technique and Sample Size

The study adopted a census sampling technique for the following reasons:

1. **Small Population Size.** The total number of adolescent girls with disabilities in the selected schools was 131, making it feasible to include all eligible participants.
2. **Maximizing Representativeness.** A census approach ensured the inclusion of all students in the target group, eliminating potential sampling bias that might arise from selecting a smaller subset.

The selection was based on the total accessible population within the study site due to the limited population, rather than a sample size formula.

The broader student population in the schools was 1,843, despite that the study specifically targeted girls with disabilities rather than the entire student body. Thus, the 101 participants represent the subset of adolescent girls with disabilities who were available and consented to participate during the study period.

## Data sources and measurements

Data for the study were obtained through questionnaires. The questionnaires were designed to collect quantitative data on the level of knowledge of MHM, including aspects such as the source of menstrual blood, whether menstruation is a disease, whether it is normal for every girl to experience menstruation, whether menstrual blood comes from the womb, whether menstruation is a sign of disease, whether women stop menstruating when they grow very old, whether good hygiene prevents menstrual pain, and whether menstruation is an indication of fertility. Additionally, the questionnaire included components assessing MHM practices.

To ensure validity and reliability, the questionnaire was pretested in Mandera County, and Cronbach's alpha testing was conducted, with a threshold of 0.7 considered acceptable [14].

## Bias

Bias was minimized by pre-testing instruments for validity and reliability, standardizing the data collection process, and applying transparent inclusion and exclusion criteria. Additionally, trained research assistants were employed and expert assessments and content validity adjustments were incorporated.

## Statistical methods

Data were analyzed using SPSS Version 22. The data were summarized using descriptive statistics (means, frequencies, standard deviations) and inferential statistics (chi-square tests) were performed at a 95% confidence interval. Significant variables ($p < 0.05$) were analysed by logistic regression to determine predictors for MHM practice.

## Ethical consideration

Ethical approval was obtained from the Kenyatta University Ethics Review Committee (KUERC) with reference No. Q139/CE/28350/15, the National Commission for Science Technology and Innovation (NACOSTI/P/22/19493) and the County commissioner's permission as well as the management of the schools which were participating. Additionally, the participants' autonomy was maintained. Written consent was sought from the school teachers, parents and guardians before the study. Where the research participants needed any support, the research team worked with the school authorities.

# Results

## Response rate

Out of the 131 targeted respondents, 101 fully participated in the study, resulting in a response rate of 77%. This response rate was deemed adequate for generalizing the study's findings since a response rate above 75% is considered excellent [15].

## Menstrual Hygiene Management Practices

**Components of Menstrual Hygiene Management Practices**. Results revealed that the majority 76 (75.2%) of the respondents did not easily access sanitary products while the

rest 25 (24.8%) accessed them easily. The majority 86 (85.1%) did not have privacy in changing menstrual pads while the rest 15 (14.9%) had privacy. Regarding the place of disposal of used menstrual sanitary products, results revealed that 64 (63.4%) disposed in a toilet while the rest 37 (36.6%) disposed outside a toilet.

Concerning the menstrual sanitary products used, results revealed that 68 (67.3%) used disposable sanitary pads followed by 14 (13.9%) who used reusable/washable pads. Further, it was noted that most 61 (60.4%) of the respondents changed their menstrual sanitary products only once a day followed by 38 (37.6%) who changed 2 or 3 times a day. Slightly more than half 53 (52.5%) revealed that water was not available while the rest 48 (47.5%) felt that water was available. See Table 2.

## Menstrual Hygiene Management practice

Menstrual Hygiene Management was measured by focusing on ease of access to disposable sanitary products, privacy of changing, disposal, products used, frequency of change and availability of water.

**Table 2:**
*Components of Menstrual Hygiene Management (MHM) Practice*

| Variable | Response | Frequency (N=101) | Percent (100%) |
|---|---|---|---|
| Ease of access to disposable sanitary products | Easily accessible | 25 | 24.8% |
| | Not easily accessible | 76 | 75.2 % |
| Privacy of changing menstrual pads | Yes | 15 | 14.9% |
| | No | 86 | 85.1% |
| Disposal of used menstrual sanitary products | In a toilet | 64 | 63.4% |
| | Outside a toilet | 37 | 36.6% |
| Menstrual sanitary products used | Disposable sanitary pad | 68 | 67.3% |
| | Reusable/washable pads | 14 | 13.9% |
| | Cloth/towel | 13 | 12.9% |
| | Toilet paper | 4 | 4.0% |
| | Cotton wool | 2 | 2.0% |
| Frequency of change of menstrual sanitary products | Once a day | 61 | 60.4% |
| | 2-3 times a day | 38 | 37.6% |
| | 4-5 times a day | 2 | 2% |
| Availability of water | Yes | 48 | 47.5% |
| | No | 53 | 52.5% |

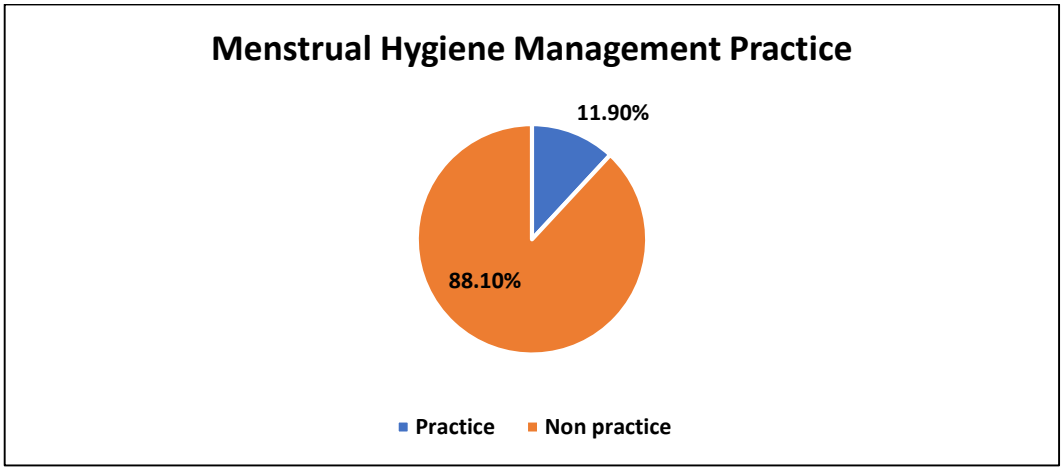


***Figure 1:***
*Menstrual Hygiene Management (MHM) Practice among participants*

Those who easily accessed had the privacy of changing, disposing of in the toilet, using appropriate products, changing at least twice a day and having water were categorized to have practised MHM. On the other hand, if any of the six components was missing then the respondent was categorized to have not practiced. Results revealed that the majority 89 (88.1%) of the respondents did not practice MHM. Figure 1.

## Distribution of responses on knowledge of menstruation and MHM practice

Results showed that 62 (61.4%) of the respondents did not have correct knowledge while the rest 39 (38.6%) had correct knowledge on whether menstruation was a disease. On whether it was normal for every girl to experience menstruation, 60 (59.4%) had incorrect knowledge while 41 (40.6%) had correct knowledge.

More than half 58 (57.4%) had correct knowledge and 43 (42.6%) had incorrect knowledge on whether menstrual blood comes from the womb. The majority 64 (63.4%) had incorrect knowledge while the rest 37 (36.6%) had correct knowledge on whether menstrual blood contained dangerous substances. The majority 82 (81.2%) lacked correct knowledge while the rest 19 (18.8%) had correct knowledge on whether women stop menstruating when they grow very old.

Most 69 (68.3%) had correct knowledge while the rest 32 (31.7%) had incorrect knowledge on whether good hygiene prevented menstrual pain. Further results showed that 66 (65.3%) had correct knowledge while the rest 35 (34.7%) had incorrect knowledge on whether menstruation was an indication of fertility. Considering all the knowledge areas, the level of knowledge was computed. Results revealed that 48 (47.5%) had a moderate knowledge level followed by 44 (43.6%) had a low knowledge level (see Table 3).

## Association between knowledge and Menstrual Hygiene Management practice

Results revealed that the majority 10 (83.3%) of those who had incorrect knowledge on whether menstruation was a disease had practised MHM. There was no statistical association between menstruation being considered a disease and the practice of MHM ($\chi 2=2.767$, P*=0.122).

**Table 3:**
*Distribution of Knowledge Responses Menstruation and MHM Practices*

| Knowledge area | Response | Frequency | Percent |
|---|---|---|---|
| Menstruation is a disease. | Correct | 39 | 38.6 |
| | Incorrect | 62 | 61.4 |
| It's normal for every girl to experience menstruation | Correct | 41 | 40.6 |
| | Incorrect | 60 | 59.4 |
| Menstrual blood comes from the womb. | Correct | 58 | 57.4 |
| | Incorrect | 43 | 42.6 |
| Menstrual blood contains dangerous substances. | Correct | 37 | 36.6 |
| | Incorrect | 64 | 63.4 |
| Women stop menstruating when they grow very old. | Correct | 19 | 18.8 |
| | Incorrect | 82 | 81.2 |
| Good hygiene prevents menstrual pain. | Correct | 69 | 68.3 |
| | Incorrect | 32 | 31.7 |
| Menstruation is an indication of fertility | Correct | 66 | 65.3 |
| | Incorrect | 35 | 34.7 |
| Level of knowledge | Low | 44 | 43.6 |
| | Moderate | 48 | 47.5 |
| | High | 9 | 8.9 |

On whether it was normal for every girl to experience menstruation, most 9 (75.0%) of those who had correct knowledge had practised MHM. There was a significant statistical association between knowledge of whether it was normal for every girl to experience menstruation and MHM practice ($\chi2$=6.685, P*=0.013).

The majority 10 (83.3%) of those who had correct knowledge on whether menstrual blood comes from the womb had practice MHM. This was significantly associated with MHM practice ($\chi2$=5.739, P*=0.042). Results further showed that 57(64.0%) of those who had incorrect knowledge on whether menstrual blood contains dangerous substances had not practice MHM. There was no statistical association between menstrual blood containing dangerous substances and MHM practice ($\chi2$=0.149, P*=0.755).

Most 10 (83.3%) of the respondents who had incorrect knowledge on whether women stop menstruating when they grow very old had practised MHM. There was no significant statistical association between knowing whether women stop menstruation when they grow very old and MHM practice ($\chi2$=0.041, P*=0.839). Most 11 (91.7%) of those who had correct knowledge on whether good hygiene prevents menstrual pain had practised MHM. Knowledge of whether good hygiene prevents menstrual pain was significantly associated with MHM ($\chi2$=15.430, P*=0.001).

The majority 11 (91.7%) of those who had correct knowledge on whether menstruation is an indication of fertility had practised MHM. There was a statistically significant association between menstruation being an indication of fertility and MHM practice ($\chi2$=14.166, P*=0.008). Results on level of knowledge revealed that 8 (66.7%) of those who had moderate knowledge had practised MHM. Level of knowledge was significantly associated with MHM practice ($\chi2$=5.756, P*=0.037). Table 4.

**Table 4:**
*Association between Knowledge and Menstrual Hygiene Management (MHM) Practice*

| Variable | Response | Menstrual Hygiene Management practice | | Statistical significance |
|---|---|---|---|---|
| | | Yes(N=12) | No(N=89) | |
| Menstruation is a disease. | Correct | 2(16.7%) | 37(41.6%) | $\chi2$=2.767 |
| | Incorrect | 10(83.3%) | 52(58.4%) | P*=0.122 |
| It is normal for every girl to experience menstruation | Correct | 9(75.0%) | 32(36.0%) | $\chi2$=6.685 |
| | Incorrect | 3(25.0%) | 57(64.0%) | P*=0.013 |
| Menstrual blood comes from the womb. | Correct | 10(83.3%) | 48(53.9%) | |
| | Incorrect | 2(16.7%) | 41(46.1%) | $\chi2$=5.739 P*=0.042 |
| Menstrual blood contains dangerous substances. | Correct | 5(41.7%) | 32(36.0%) | |
| | Incorrect | 7(58.3%) | 57(64.0%) | $\chi2$=0.149 P*=0.755 |
| Women stop menstruating when they grow very old. | Correct | 2(16.7%) | 17(19.1%) | $\chi2$=0.041 P*=0.839 |
| | Incorrect | 10(83.3%) | 72(80.9%) | |
| Good hygiene prevents menstrual pain | Correct | 11(91.7%) | 58(65.2%) | $\chi2$=15.430 |
| | Incorrect | 1(8.3%) | 31(34.8%) | P*=0.001 |
| Menstruation is an indication of fertility | Correct | 11(91.7%) | 55(61.8%) | $\chi2$=14.166 |
| | Incorrect | 1(8.3%) | 34(38.2%) | P*=0.008 |
| Level of knowledge | Low | 1(8.3%) | 43(48.4%) | |
| | Moderate | 8(66.7%) | 40(44.9%) | $\chi2$=5.756 |
| | High | 3(25.0%) | 6(6.7%) | P*=0.037 |

**P*=Fishers exact**

## Predictors for Menstrual Hygiene Management

All variables that were significantly associated with MHM practice in the preliminary Chi-square analysis were included in the logistic regression model to identify the key predictors. Regarding knowledge of menstruation and MHM, the results indicated that individuals who correctly understood that it is normal for every girl to experience menstruation were significantly more likely to practice MHM (AOR = 7.417, 95% CI: 1.462–37.625, p = 0.001). Additionally, those who correctly recognized that menstruation is an indication of fertility were also more likely to practice MHM (AOR = 6.800, 95% CI: 0.840–55.049, p = 0.045).

Furthermore, knowledge level was a significant predictor. Participants with moderate knowledge had a significantly higher likelihood of practicing MHM compared to those with low knowledge (AOR = 4.306, 95% CI: 1.174–15.788, p = 0.028). However, there was no significant difference in MHM practice between individuals with high and low knowledge levels (AOR = 0.888, 95% CI: 0.434–19.441, p = 0.896).

On the availability of institutional resources, logistic regression results revealed that participants who reported insufficient water availability in schools were significantly less likely to practice MHM (AOR = 0.095, 95% CI: 0.011–0.686, p = 0.021) See Table 5.

# Discussion

## Menstrual Hygiene Management practices

The findings on MHM practices, as measured by various components such as access to sanitary products, privacy, disposal, product appropriateness, frequency of change, and water availability, show a concerning trend among respondents, with the majority not practising proper MHM. This highlights the difficulties associated with ensuring appropriate menstrual hygiene, particularly for girls with disabilities consistent with previous reports of various hurdles to MHM faced by girls with impairments, such as inadequate access to appropriate items and facilities [16]. Furthermore, the importance of comprehensive MHM programs that address the unique requirements of girls with disabilities, such as providing access to appropriate items and facilities has been emphasised. [17] However, these findings may reflect broader issues with access to MHM resources and facilities in Kenya, such as inadequate infrastructure and a scarcity of affordable menstrual products. [18] Furthermore, Chandra-Mouli & Patel [19] emphasized the need for tailoring MHM programs for girls with disabilities to meet unique needs such as accessibility and privacy.

**Table 5:**
*Logistic Regression of Factors Associated with Menstrual Hygiene Management MHM Practice*

| Independent variable | Category | B | S.E. | Wald | Sig. | AOR | 95% C.I. for OR | |
|---|---|---|---|---|---|---|---|---|
| | | | | | | | Lower | Upper |
| It is normal for every girl to experience menstruation | Incorrect | Ref | | | | | | |
| | Correct | 2.004 | .308 | 42.455 | .001* | 7.417 | 1.462 | 2.762 |
| Menstrual blood comes from the womb. | Incorrect | Ref | | | | | | |
| | Correct | 1.452 | .803 | 3.267 | .071 | 4.271 | .885 | 20.618 |
| Good hygiene prevents menstrual pain. | Incorrect | Ref | | | | | | |
| | Correct | 1.771 | 1.068 | 2.752 | .097 | 5.879 | .725 | 47.679 |
| Menstruation is an indication of fertility. | Incorrect | | | | | | | |
| | Correct | 1.917 | 1.067 | 3.228 | .045* | 6.800 | .840 | 55.049 |
| Level of knowledge | Low | Ref | | | | | | |
| | Moderate | 1.460 | .663 | 4.851 | .028* | 4.306 | 1.174 | 15.788 |
| | High | -.119 | .909 | .017 | .896 | .888 | .434 | 19.441 |

### Association between level of knowledge on menstruation and MHM practices.

The results revealed that the majority of the respondents with false beliefs that menstruation is a sickness still performed MHM. This is in agreement with a study conducted by Otieno et al. [18], who found that misconceptions regarding menstruation did not always connect with poor MHM practices among girls in informal settlements, suggesting that practical knowledge and resources might play a more essential role. In contrast, the vast majority of the girls possessed accurate knowledge of MHM. This is consistent with Kimani-Murage et al. [20], who stated that a proper understanding of menstruation is critical for effective MHM, particularly among adolescents. Wilson et al. [17], disagreed, noting that among girls with disabilities, even those with precise knowledge of menstruation encounter considerable difficulties due to physical challenges and inadequate support systems, preventing effective MHM practices regardless of their understanding.

According to the origin of menstrual blood, the majority of those with correct knowledge practised MHM; this is consistent with the finding by Otieno et al. [18], that accurate information about menstruation's biological aspects promotes better hygiene practices among girls in informal settlements. On the other hand, the majority of those who had inaccurate knowledge regarding menstrual blood containing harmful compounds did not perform MHM, implying that misconceptions may not be the most important factor in MHM behaviours. It has also been shown that among girls with disabilities, practical difficulties frequently surpass knowledge, demonstrating that while knowing menstruation is critical, physical and systemic challenges can still limit effective MHM [17].

Concerning when women stopped menstruating, the majority of respondents with incorrect knowledge about when women stopped menstruation continued to practice MHM, which is consistent with Otieno et al. [18], who discovered that specific misconceptions about menstruation do not necessarily impede MHM practices among girls in informal settlements, implying that other factors such as access to hygiene products and education play a more important role. On the other hand, the majority of those who understood that proper cleanliness prevented menstrual pain practised MHM. This is consistent with Kimani-Murage et al. [20], who stated that a proper understanding of the benefits of excellent menstrual hygiene can greatly enhance MHM behaviours, particularly among adolescent girls. However, even with precise understanding, girls with impairments may face practical hurdles such as inadequate access to appropriate facilities and support [17].

Concerning menstruation as an indicator of fertility, the majority of those with correct knowledge practised MHM, which is consistent with Otieno et al. [18], who reported that comprehensive menstrual education positively influences hygiene practices among girls in informal settlements, highlighting the importance of accurate information in empowering girls to manage menstruation effectively. Furthermore, the level of education had a substantial impact on MHM behaviours, with the majority of individuals with moderate knowledge practising appropriate hygiene.

## Study Limitations

- Findings may not be generalizable beyond the selected schools or to other counties in Kenya.
- Selection bias, as schools were selected based on researcher judgment rather than randomization.

## Conclusion

The study concludes that Menstrual Hygiene Management practice was very low among adolescent girls with disabilities in selected schools in Wajir County. Privacy of changing menstrual pads and ease of access to disposable sanitary pads were the main components affecting menstrual hygiene management.

Knowledge factors that predicted Menstrual Hygiene Management practice were, the belief that it was normal for every girl to experience menstruation (AOR=7.417, p=0.001), menstruation as an indicator of fertility (AOR=6.800, p=0.045) and level of knowledge (AOR=4.206, p=0.028).

## Recommendations

**Recommendation for practice.** The study recommends that in order to improve MHM among girls with disabilities, schools should scale up awareness campaigns that are disability friendly to reduce stigma and educate students, parents, and caregivers. Comprehensive menstrual health education, including practical demonstrations, should be integrated into curricula to increase the level of knowledge on MHM practice. Engaging boys and male teachers in MHM programs will foster a supportive environment. Additionally, training peer educators will help combat misinformation and promote positive hygiene practices, encouraging behaviour change and improving menstrual health outcomes in school communities.

**Recommendation for policy.** The study recommends that the Ministry of Health, Ministry of Education and other stakeholders should focus on provision of free re-usable sanitary towels to the girls living with disability and also provide enough changing rooms within the school environment. Disability-inclusive MHM education should be integrated into curricula, equipping teachers with adaptive techniques. Schools must improve sanitary facilities by ensuring accessibility, privacy, and product availability. Regular monitoring and evaluation should assess program effectiveness, incorporating feedback from students, teachers, and parents to refine policies and enhance accountability.


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