

Original Research Article

Menstrual Health Knowledge and Hygiene Practices among Female Students of Rivers State College of Health Science and Management Technology, Port Harcourt, Nigeria

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Abstract: Menstrual health literacy is essential for female students' well-being, reproductive health, dignity, and academic participation. Despite increasing awareness, knowledge gaps and suboptimal menstrual hygiene practices remain among young women in higher institutions. This study assessed menstrual health knowledge and hygiene practices among female students of Rivers State College of Health Science and Management Technology, Port Harcourt, Nigeria. A descriptive cross-sectional survey design was adopted. The study population comprised female students aged 16–40 years who had attained menarche. Using Taro Yamane's formula, a minimum sample size of 348 was obtained, while 340 valid questionnaires were analyzed. Data were collected using a structured self-administered questionnaire and analyzed with frequencies, percentages, means, and standard deviations. Most respondents were aged 16–24 years (50.0%), single (87.6%), Christian (97.1%), and in their first or second year of study (73.4%). Respondents demonstrated a high level of menstrual-cycle knowledge, with mean scores exceeding the 3.50 decision threshold for awareness of menstruation, cycle interval, menstrual-flow duration, quantity of flow, and ovulation timing. Menstrual hygiene practices were also generally satisfactory, particularly regarding self-care, pad-changing frequency, use of sanitary materials, vulva cleaning, and handwashing after pad changes. However, variations in some hygiene practices indicate that adequate knowledge does not always translate into optimal behavior. The study concludes that while menstrual health literacy among female students is generally high, sustained health education, strengthened campus health services, improved sanitation facilities, and affordable menstrual products are needed to reinforce positive practices and improve menstrual health management in tertiary institutions.

Keywords: Menstrual Health; Menstrual Hygiene; Menstrual Cycle Knowledge; Female Students; Tertiary Institution; Nigeria.

Introduction

Menstrual health is an essential part of women's sexual and reproductive health and a key determinant of dignity, wellbeing, school attendance and social inclusion. It is not just about the monthly biological experience of menstruation. It includes accurate knowledge of the menstrual cycle, access to safe materials, supportive water and sanitation facilities, freedom from stigma and the ability to manage menstruation safely and confidently. According to Hennegan et al. (2019) menstrual health is a multidimensional problem that is influenced by biological, social, economic, cultural and environmental conditions. This is especially relevant in education settings where menstruation can affect attendance, concentration, comfort, confidence and participation in day-to-day academic activities.

Menstrual health and hygiene are still not enough of a focus in many low- and middle-income countries despite increasing global attention. Misinformation, silence, stigma, lack of reproductive health education and poor sanitation infrastructure continue to influence the menstrual experiences of girls and young women. Sommer et al. (2016) argued that menstrual hygiene management is both a public health and human rights issue because menstruation affects comfort, safety, mobility, participation and dignity. Likewise, UNICEF (2019) and the World Health Organization (2022) have linked menstrual health to wider developmental objectives such as health, education, gender equality, water and sanitation, and social protection.

Cultural, religious and social norms in Nigeria can influence how menstruation is managed and can restrict open discussion on menstrual issues. Many young women have some knowledge of menstruation before or during menarche, this does not always include correct knowledge of ovulation, variation in normal menstrual cycle, the duration of menstrual flow, safe product use, hygienic genital care or the disposal of used materials. Earlier studies in Nigeria have revealed that awareness of menstruation may be high but knowledge and hygienic practices are uneven (Aniebue et al., 2009; Lawan et al., 2010; Oche et al., 2012). These gaps can result in anxiety, poor self-management, risky hygiene practices and avoidable reproductive health problems.

Female students in higher institutions are an important population for research into menstrual health. They are usually in the reproductive age group, active in academic and social activities and may be peer educators, family influencers and future professionals. This is very important in health-related institutions where students are expected to acquire and advocate the right health knowledge. However, simply being enrolled in a tertiary or health-related institution does not guarantee complete menstrual health literacy or equal menstrual hygiene practices. Gaps can remain because of limited access to menstrual materials, inadequate sanitation facilities, social embarrassment, poor waste-disposal systems, or misconceptions passed through family and peer networks.

While there are several Nigerian studies on menstrual hygiene among adolescents and university students, most of these have focused on secondary school populations or general undergraduate students with little attention to students enrolled in health-related tertiary institutions. Also, there are few researches on the knowledge of the menstrual cycle and menstrual hygiene practices among female students in Rivers State at the same time. Because the students in health training institutions are expected to have higher reproductive health literacy, there is need to establish through empirical data whether this expectation results in optimal menstrual hygiene practices. To fill this gap, the study assesses the knowledge and hygiene practices of female students of Rivers State College of Health Science and Management Technology on menstrual health.

Objectives of the Study

The general objective of the study was to assess menstrual health knowledge and hygiene practices among female students of Rivers State College of Health Science and Management Technology, Port Harcourt, Nigeria. The specific objectives were to:

- i. describes the socio-demographic characteristics of the respondents;
- ii. assess respondents' knowledge of the menstrual cycle;
- iii. determine respondents' menstrual hygiene practices during menstrual flow; and
- iv. Identify areas of menstrual health knowledge and practice that require further institutional support and health education.

Theoretical framework:

Two well-established behavioral and educational theories provide strong conceptual support for the study namely Health Belief Model (HBM) and the Social Cognitive Theory (SCT). The Health Belief Model explains health-related behaviors based on individuals' perceptions of susceptibility, severity, benefits, and barriers, alongside cues to action and self-efficacy. In the context of menstrual health, female students' understanding of menstruation, perceived risks of poor menstrual hygiene, and beliefs about the benefits of proper practices significantly influence their behavior. Knowledge gaps may reduce perceived susceptibility to menstrual-related infections or complications, leading to suboptimal hygiene practices.

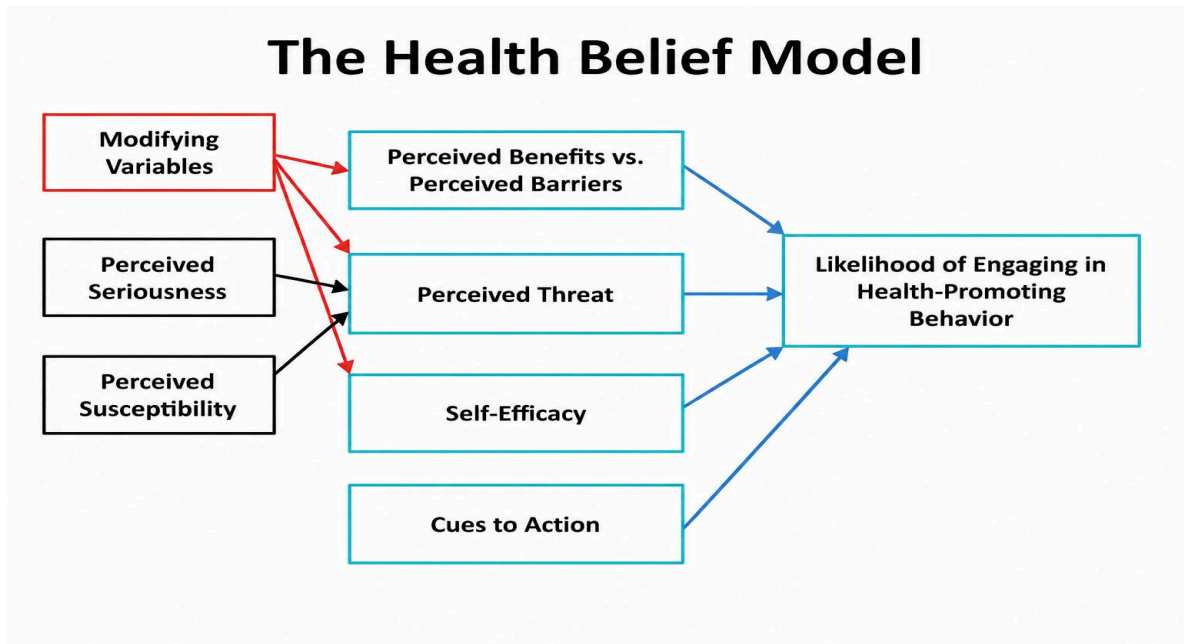


Figure 1: The Health Belief Model

Applying HBM helps explain why improving menstrual health knowledge can positively shift attitudes and motivate students to adopt healthier menstrual hygiene behaviors, particularly when educational interventions emphasize benefits and reduce perceived barriers such as stigma and misinformation. Social Cognitive Theory (SCT).

Social Cognitive Theory emphasizes the dynamic interaction between personal factors, environmental influences, and behavior. Menstrual health knowledge among female students is shaped not only by individual awareness but also by peer influence, cultural norms, institutional support, and access to accurate information.

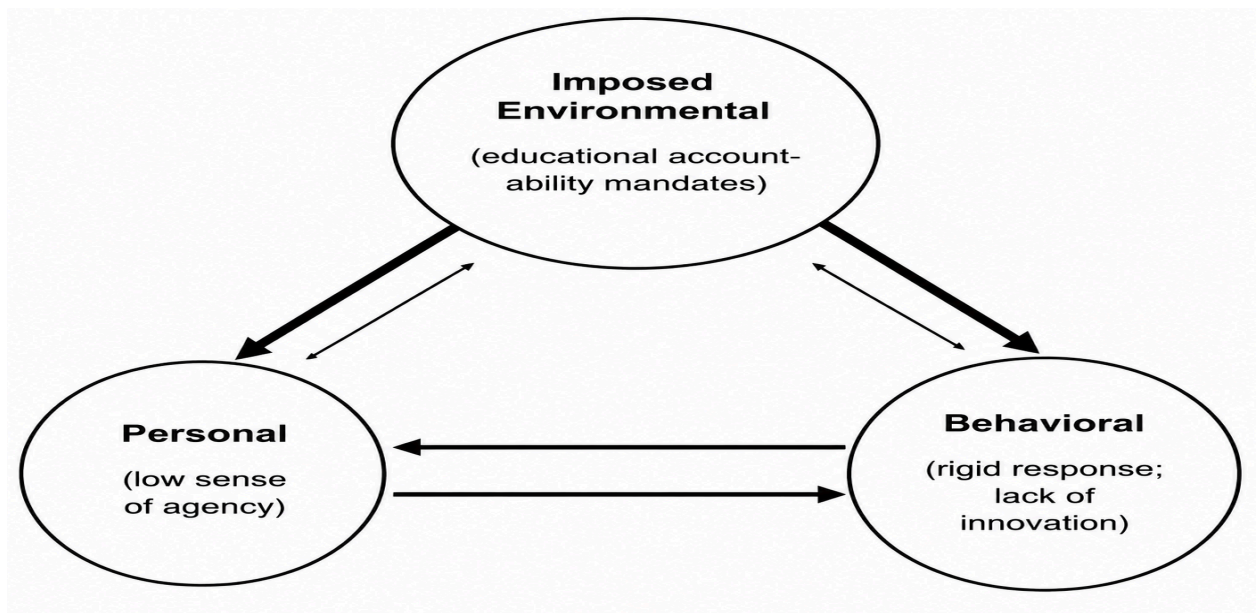


Figure 2: Social Cognitive Theory

Within higher institutions, observing peers who practice proper menstrual hygiene, receiving reinforcement through health education, and accessing supportive facilities can strengthen self-efficacy and positive behavioral outcomes. SCT therefore provides a useful framework for understanding how structured health education, peer learning, and supportive school environments can collectively bridge menstrual health knowledge gaps and promote sustained healthy practices.

Together, these theories justify the focus on knowledge enhancement as a pathway to improved menstrual health attitudes and practices among female students in higher institutions.

Methodology

Study Area

The study was carried out at Rivers State College of Health Science and Management Technology, a public tertiary institution situated along Ikwerre Road, Rumueme, Port Harcourt, Rivers State, Nigeria. The institution was established in 1974 and re-designated in 2019, following the approval of a bill by the National Assembly. It is a monotechnic accredited by the National Board for Technical Education (NBTE). It offers certificate, National Diploma and Higher National Diploma courses in various health related fields such as Environmental Health, Community Health, Pharmacy Technology and other allied health sciences.

At the time of the study, the institution had a student population of over 2,600 students with students in several schools and departments. The college is an appropriate setting to conduct the study as it trains a predominantly young female population in health-related fields, making it suitable to assess menstrual health knowledge and hygiene practices.

Research Design

The study employed a descriptive cross-sectional research design. This design was considered appropriate as it permits data to be collected from respondents at one point in time to describe current conditions, patterns and behaviours. This is common in public health research where the objective is to measure knowledge, attitudes and self-reported practices of a specific population without any intervention (Creswell & Creswell, 2018; Polit & Beck, 2021).

Study Population and Eligibility Criteria

The study population comprised registered female students of Rivers State College of Health Science and Management Technology aged 16–40 years who had attained menarche and were enrolled during the period of data collection. Only students who were present at the time of survey and consented to participate were included.

Female students who were absent during data collection, those who declined participation, male students, and individuals who had ceased menstruation were excluded from the study to ensure relevance to menstrual health assessment.

Sample Size Determination

The minimum sample size was determined using Taro Yamane's formula at a 5% margin of error:

$$n = N / [1 + N(e^2)] \quad (1)$$

Where:

n = minimum sample size

N = population size

e = margin of error (0.05)

Using this formula, a minimum sample size of 348 respondents was obtained. However, after data cleaning and screening, 340 questionnaires were found to be fully completed and valid for analysis, representing a response rate of 97.7%.

For the menstrual hygiene practice section, only 295 respondents provided complete responses across all relevant items. Therefore, listwise deletion was applied for that section only, which explains the variation in sample sizes across tables.

Additionally, Cochran's formula for single proportion was considered to validate adequacy where population proportion is unknown:

$$n_0 = Z^2pq / e^2 \quad (2)$$

Where p = 0.5 was assumed to maximize sample size, ensuring adequacy for statistical representation (Cochran, 1977).

Sampling Technique

A multistage sampling technique was employed to ensure representativeness. First, the institution was stratified into its various schools and departments. In the second stage, proportional allocation was applied, and eligible female students were selected using simple random sampling from each stratum. This ensured that students from different academic levels and disciplines were adequately represented in the study.

Instrument for Data Collection

Data were collected using a structured, self-administered questionnaire written in clear and simple language to ensure comprehension. The instrument consisted of sections covering socio-demographic characteristics, menstrual cycle knowledge, menstrual hygiene practices, and influencing factors. Menstrual knowledge and hygiene practice items were measured using a Likert-type scale and summarized using mean scores and standard deviations. Categorical variables such as type of sanitary material and disposal methods were summarized using frequencies and percentages where applicable.

Validity and Reliability of the Instrument

The questionnaire was developed based on the study objectives and existing literature on menstrual health. Content validity was ensured through expert review by specialists in public health and community health. However, due to limitations in the

available dataset, reliability testing such as Cronbach's alpha was not reported in this manuscript.

Future studies are recommended to include pilot testing and reliability assessment to strengthen the internal consistency of the instrument.

Method of Data Analysis

Data were coded, cleaned, and entered into Microsoft Excel before being exported to SPSS version 20 for analysis. Descriptive statistics such as frequencies and percentages were used for socio-demographic variables, while means and standard deviations were used for menstrual knowledge and hygiene practices.

Percentages were computed using:

$$\text{Percentage} = (f / N) \times 100 \quad (3)$$

Mean scores were calculated as:

$$\text{Mean } (\bar{X}) = \Sigma x / n \quad (4)$$

Standard deviation was computed as:

$$SD = \sqrt{[\Sigma(x - \bar{X})^2 / (n - 1)]} \quad (5)$$

A composite index was derived by averaging domain scores:

$$\text{Composite Index} = \Sigma(\text{mean domain scores}) / \text{number of domains}$$

A decision rule of 3.50 was used, where mean scores ≥ 3.50 indicated adequate knowledge or satisfactory practice, while scores below 3.50 indicated inadequate knowledge or poor practice. Inferential statistics such as chi-square, t-test, ANOVA, and regression were recommended for future studies to examine relationships between variables.

Ethical Considerations

Ethical approval was obtained from the appropriate institutional authority prior to data collection. Permission was also secured from school authorities. Participation was voluntary, and informed consent was obtained from all respondents.

Results and Discussion

Table 1: Socio-demographic characteristics of the respondents

SN	Variables	Frequency (n = 340)	Percentage (%)
1.	School Environmental Health	70	20.6
	Community Health	55	16.2
	Pharmacy	75	22.0
	Others	140	41.1
	Total	340	100.0
2.	Level of Study-100Level	130	38.2
	200 Level	120	35.2
	300 Level	65	19.2
	400 Level	25	7.4
	Total	340	100.0
3.	Marital Status-Single	298	87.6
	Married	40	11.8
	Divorced	1	0.3
	Widowed	1	0.3
	Total	340	100.0
4.	Religion-Christianity	330	97.1
	Islam	8	2.3
	Traditional Religion	1	0.3
	Others	1	0.3
	Total	340	100.0

Source: field survey, 2021

Table 1: Socio-demographic characteristics of the respondents The table shows that the respondents were from different academic programmes in the institution. The largest proportion of respondents was from “Others” (41.1%) followed by Pharmacy (22.0%), Environmental Health (20.6%) and Community Health (16.2%). This distribution shows a broad representation of health-related disciplines in the sample, which is crucial for menstrual health studies, as exposure to reproductive health education can vary by programme. Similar findings have been reported in Nigerian tertiary institutions where students from health-related courses demonstrated varied levels of health literacy based on their exposure to the curriculum (Oche et al., 2018; Olugbenga-Bello et al., 2017).

In terms of level of study, the majority of the respondents were in the lower academic levels with 100 level students accounting for 38.2% and 200 level students accounting for 35.2%. This indicates a large proportion of early-year students in the sample, implying limited exposure to advanced health education topics usually offered in higher levels. This is in line with findings of Afolabi et al. (2020) who reported that menstrual health knowledge improves with increasing academic progression and exposure to structured reproductive health education in tertiary institutions. The differences in menstrual hygiene practices reported in similar studies among Nigerian undergraduates may therefore partly be due to the dominance of lower level students (Uzoechi et al., 2023).

The results also indicate that the majority of the respondents were single (87.6%) and predominantly Christian (97.1%) which is in line with the typical demographic composition of undergraduate populations in southern Nigeria. The very low proportion of married, divorced or widowed respondents is predictable in view of the age profile of tertiary students. The religious profile is consistent with national demographic trends where Christianity is the dominant religion in Nigeria's South-South region. These socio-demographic characteristics are significant because cultural and religious beliefs have been found to affect the attitudes, stigma and hygiene practices of young women to menstruation (UNICEF, 2021; National Bureau of Statistics, 2023). The sample as a whole is a young population that is predominantly single and religiously homogenous, providing an appropriate setting for the evaluation of menstrual health knowledge and hygiene behaviour in line with previous Nigerian studies (Oche et al., 2018; Afolabi et al., 2020).

Table 2: Respondents' knowledge of the menstrual cycle

Variable	N	Mean	SD	Remark
Have you heard about the menstrual cycle before?	340	4.48	0.880	Accept
How many days do you think are between one period and another menstrual flow?	340	4.03	1.186	Accept
What is your normal menstrual flow in terms of quantity?	340	3.83	1.366	Accept
Menstrual blood flow lasts for how many days?	340	4.61	0.634	Accept
Ovulation normally occurs on which day of the menstrual cycle?	340	4.38	0.906	Accept

Decision rule: mean score of 3.50 and above = adequate knowledge/accepted; mean score below 3.50 = inadequate knowledge/rejected.

Source: Field survey, 2021.

Table 2: Respondents' knowledge of menstrual cycle The findings show that the female students have a generally high level of awareness and understanding of the menstrual cycle. All items had a mean score above the benchmark of 3.50, which shows that respondents had adequate knowledge of key concepts on the menstrual cycle. In particular, awareness of menstruation had a high mean score ($M = 4.48$, $SD = 0.880$) which suggests that most of the respondents had prior knowledge about menstruation through formal education, peer influence or health related courses. This is similar to the Nigerian studies that revealed that the level of awareness among students in tertiary institutions is generally high, but the depth of understanding may still vary (Oche et al., 2018; Lawan et al., 2010).

Furthermore, the respondents had good knowledge about the length of menstrual flow ($M = 4.61$, $SD = 0.634$) which is the highest mean score in the table. Relatively good understanding of reproductive physiology is also indicated by knowledge of cycle interval ($M = 4.03$, $SD = 1.186$) and timing of ovulation ($M = 4.38$, $SD = 0.906$). This suggests that a large number of respondents have functional reproductive health literacy which is important for self-management of menstruation and prevention of reproductive health complications. However, the slightly higher standard deviations in some items indicate

variability in responses and suggest that not all respondents have a uniform understanding of the items. Similar trends have been reported among Nigerian undergraduates, where the overall awareness is high but the conceptual correctness is not consistent (Olugbenga-Bello et al., 2017).

However, the knowledge of the quantity of normal menstrual flow had the lowest mean score ($M = 3.83$, $SD = 1.366$), but was higher than the acceptance level. This indicates some ambiguity in differentiating normal from abnormal menstrual bleeding, which may subject students to misconceptions about reproductive health. These gaps have been reported in Nigerian studies where adolescents and young adults, despite a general awareness, often do not have accurate biomedical knowledge of menstrual characteristics (Afolabi et al., 2020; UNICEF, 2021). Overall, the results indicate that while respondents possess adequate knowledge of the menstrual cycle, there is a need for targeted health education to improve conceptual clarity and reduce variability in understanding across different domains.

Table 3: hygiene practices during menstrual flow

Variable	N	Mean	SD	Remark
Have you ever practiced menstrual hygiene?	295	4.59	0.755	Accept
Do you take appropriate action in caring for yourself and materials used during your menstrual period?	295	4.13	1.213	Accept
How often do you change your sanitary pad during menstruation?	295	3.68	1.352	Accept
Which sanitary materials do you use during menstruation?	295	3.72	1.428	Accept
How do you discard used pads?	295	4.55	0.513	Accept
What do you use to clean your vulva during menstruation?	295	3.77	1.516	Accept
Do you ensure appropriate handwashing after changing a soaked sanitary pad?	295	3.63	1.216	Accept

Source: field survey, 2021

Table 3 presents the menstrual hygiene practices of the respondents during their menstrual flow. The findings tend to show good hygienic behaviour of the female students. Most of the respondents reported that they had practiced menstrual hygiene ($M = 4.59$, $SD = 0.755$) indicating that basic measures of hygiene during menstruation are widely known and adopted. Likewise, the respondents indicated that they are doing the right things to take care of themselves and their menstrual materials ($M = 4.13$, $SD = 1.213$), indicating a generally positive attitude towards MHM. These findings corroborate with research among Nigerian students in tertiary institutions where increased awareness and exposure to health education correlated with better menstrual hygiene practices (Oche et al., 2018; Afolabi et al., 2020).

In addition, the findings also indicate that respondents had relatively good practices on the disposal of used sanitary pads ($M = 4.55$, $SD = 0.513$), which had one of the highest mean scores in the table. It shows that majority of the students are aware of the right ways of waste disposal probably due to increase in awareness of public health and sanitation policies at institutions. However, the variability in responses for pad-changing frequency

($M = 3.68$, $SD = 1.352$) and vulva cleaning practices ($M = 3.77$, $SD = 1.516$) indicates inconsistencies in personal hygiene routines. Similar studies in Nigeria have recorded such variations where knowledge does not always translate into consistent hygienic behaviour due to factors such as access to materials, cultural practices and personal habits (Olugbenga-Bello et al., 2017).

Moreover, hand washing after changing soaked sanitary pads had the lowest mean score ($M = 3.63$, $SD = 1.216$) but was still within the acceptable range. This is a significant finding from a public health perspective as inadequate hand hygiene during menstruation may elevate the risk of reproductive tract infections. Similarly, studies in Nigeria and other low- and middle-income settings have found that hand hygiene remains a persistent gap in menstrual hygiene practices, despite overall awareness (Lawan et al., 2010; UNICEF, 2021).

Conclusion

This study evaluated menstrual health knowledge and hygiene practices among female students of Rivers State College of Health Science and Management Technology, Port Harcourt, Nigeria. The findings indicate that the respondents had generally adequate knowledge of the menstrual cycle and reported largely satisfactory menstrual hygiene practices. High awareness of menstruation, good knowledge about the duration of menstrual flow, and adequate understanding of ovulation indicate functional menstrual health literacy in many respondents. However, lower and more variable scores in areas like normal menstrual-flow quantity, frequency of changing pads, vulva cleaning, and handwashing after changing soaked sanitary pads suggest that menstrual health knowledge is not uniformly translated into consistent hygienic practice.

The study recommends that more than awareness is needed to bridge the gaps in knowledge on menstrual health in higher institutions. It requires continuous education on reproductive health, access to low-cost menstrual products, sufficient water and sanitation facilities, safe waste disposal systems and supportive campus health services. Strengthening menstrual health programmes in higher institutions will improve female students' wellbeing, promote dignity and confidence and contribute to broader goals of reproductive health, gender equity and quality education

Recommendations

- i. Strengthen menstrual health education in institutional curricula and orientation programs to improve knowledge and correct misconceptions.
- ii. Provide adequate sanitation facilities and menstrual hygiene materials in schools to support safe and consistent practices.
- iii. Promote behaviour change campaigns focusing on handwashing, pad changing, and proper disposal of sanitary products.
- iv. Enhance campus health services with counselling and peer education to support menstrual health awareness and practice.

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Conflict of Interest

The authors declare that there is no conflict of interest associated with this study.

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