

## Original Research Article

# Menstrual health and hygiene practices in higher educational institutions: a case study of female students in Dibrugarh, Assam, India

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## ABSTRACT

**Background:** Menstruation health and hygiene management (MHM) remains a critical public health concern in educational institutions, particularly in developing countries where sanitation infrastructure and awareness vary widely. Though it is a natural biological process, however, many face significant menstrual problems, including dysmenorrhea, irregular periods, and menorrhagia, which can affect their physical and emotional well-being.

**Methods:** This cross-sectional study examines menstrual health practices, hygiene satisfaction and sanitation infrastructure among female students of Dibrugarh, Assam, India. A total of 218 students (177 postgraduate, 41 undergraduate) participated using a structured questionnaires distributed both in person and via online forms. Simple random sampling was employed. Descriptive statistics and correlation analysis were performed using Jamovi software.

**Results:** The majority 73.39% reported regular, while 95% relied on sanitary pads, indicating low adoption of sustainable alternatives such as menstrual cups (7.3%). Approximately 64% of respondents avoided campus toilets during menstruation, primarily due to poor hygiene and lack of sanitation facilities.

**Conclusions:** Although 79% reported reliable access to running water facilities, dissatisfaction with washroom cleanliness remained high. Disposal practices showed moderate hygiene infrastructure, sanitation awareness, waste management practices in educational institutions. The findings suggest the need for policy interventions including improved sanitation infrastructure, increased awareness programs and sustainable menstrual waste management systems.

**Keywords:** Assam, Dibrugarh, Hygiene practices, Menstrual health, Menstrual waste

## INTRODUCTION

Menstrual Hygiene Management (MHM) refers to the access to feminine hygiene products, proper sanitation facilities, the privacy to change those products, and safe disposal of them with dignity and awareness regarding menstrual health. Inadequate sanitation facilities in schools significantly affect attendance, participation and overall academic performance of female students.<sup>1,2</sup> MHM involves maintaining hygiene during the menstrual process. In the context of schools and colleges, MHM is a critical factor that bridges the gap between public health

and educational gender equality. Around the world, menstrual health and hygiene needs are being overlooked due to limited access to information, education, products and services, as well as inadequate facilities and social inequalities.<sup>2</sup> It is closely associated with reproductive health, infection prevention and psychological wellbeing.<sup>3</sup> According to reports of Ministry of Health and Family Welfare Government of India approximately 375 million girls and women in the reproductive age group and most of them menstruating an estimated 1.021 billion pads are disposed monthly and majority of which is non-biodegradable in nature.<sup>4</sup> Disposal of sanitary products and washing behaviours are primarily driven by the

physical state of sanitation facilities and also intrinsically linked to taboos surrounding and knowledge of menstruation.<sup>5</sup> Very small number of women use modern menstrual hygiene methods and most of them uses old methods. A significant number of female students absent during menstruation.<sup>6</sup> Absenteeism is a problem which can negatively affect the academic performance of students.<sup>7-9</sup> Educational institutions lacking clean water, private toilets, disposal facilities and affordable sanitary products contribute indirectly to absenteeism, discomfort and stigma among menstruation students.<sup>10-12</sup> Various government policies and programs have attempted to improve MHM in schools over recent years and the current momentum offers potential for even wider impact across India. However, the implementation of these initiatives often limited by inadequate infrastructure maintenance, insufficient awareness and social stigma.<sup>13</sup> Fear, shame, ongoing social taboos, ignorant unsupportive teachers, lack of water, sanitation, disposal facilities, and privacy, are some of the barriers in building an enabling environment for safe and hygienic menstrual practices within the school premises. The Government of India implemented the Menstrual Hygiene Scheme (MHS) and the National MHM Guidelines.<sup>14,15</sup> These policies aim to promote menstrual health through the distribution of subsidized sanitary napkins and the installation of incinerations in schools. However, as noted in recent meta-analyses, the effectiveness of these policies often hinges on “system-level” actions, including teacher training and the consistent maintenance of infrastructure.<sup>16</sup> Menstruation wastes are the wastes that varies significantly across the country. The management of menstrual waste in schools and colleges is one of the most neglected components of MHM in India. While much of the policy focus has been supply of sanitary products, the safe and discreet disposal of these products remains a significant challenge. This study aims to address the hygiene practices and analyse the sanitation and hygiene infrastructure available in educational institutes and to evaluate menstrual waste disposal practices adopted by students. This work also discusses on the role of the institutions in promoting menstrual hygiene awareness and support, to assess the availability and adequacy of sanitation facilities such as toilets, water, disposal systems in the institutions and to suggest measures for improving menstrual hygiene management in higher educational institutes.

## METHODS

The present study area was conducted in Dibrugarh district of Assam, India, located between 95.0 East longitude and 27.48 North latitude. The district hosts a number of educational institutes. Data collected from selected institutes that enrolling a large number of female students aged approximately 17 to 23 years, representing a critical age group for understanding menstrual health knowledge and hygiene practices.

## Study design and sampling

A cross-sectional study design was employed using simple random sampling, as the target population represents a relatively homogenous group regarding the study variable. Informed consent was obtained from all participants. The study was conducted from January 2025 to March 2025.

## Inclusion criteria

Inclusion criteria include female students enrolled in selected higher education and voluntary participation.

## Exclusion included

Exclusion included male students, female students unwilling to participate, incomplete questionnaires.

## Data sources and collection

The study utilized both primary and secondary data sources. Primary data were collected using structured questionnaires, Google form surveys, direct interaction with students. The questions included multiple-choice, open ended and close ended items. A Total 230 questionnaires were distributed. However, total 218 responses received, out of which 177 responses received from the university students of Dibrugarh through direct questionnaire and 41 college students through google forms that was circulated through WhatsApp and other online platforms.

Secondary data are collected from some authentic websites like UNICEF, WHO, Ministry of Health and Family Welfare reports and peer reviewed literature. This involves identifying, appraising, and synthesizing all relevant research evidence to provide a comprehensive overview of menstrual health and hygiene and menstrual waste and preparedness.

## Data analysis

Descriptive statistics including frequency analysis, percentage distribution, mean calculation, comparative interpretation and correlation analysis using Pearson's method were performed in Jamovi software.

## Composite indicators

Three composite indicators were conducted including Menstrual Hygiene Awareness Index (MHAI), Infrastructure Adequacy Index (IAI) and Sanitation Satisfaction Index (SSI).<sup>1,17</sup> The following methods were used to determine the composite indicators.

$$MHI = (Score_1 + Score_2 + Score_3)$$

Where, MHI is calculated by the sum of the total scores of selected parameters.

Similarly,

$$IAI = \frac{\sum_{i=1}^n w_i \times x_i}{\sum_{i=1}^n w_i}$$

Where,  $x_i$  is the Score of the  $i$ -th infrastructure component and  $w_i$  indicates weight assigned to the  $i$ -th component based on importance.

$$SSI = \sum_{i=1}^K \frac{S_i \times w_i}{S_{max}}$$

Where,  $S_i$ = Satisfaction score for specific attribute;  $W_i$  = Weight of the attribute;  $S_{max}$ = Maximum possible score.

All indices were normalized to a scale 0-100% scale, with higher scores indicating better outcomes.

## RESULTS

The findings of the study provide significant insights into menstrual hygiene practices and institutional sanitation conditions among female students in Dibrugarh. The findings align with global reports by the WHO and the UNICEF, that highlights the importance of menstruation problems, hygiene and health.

### Demographic aspects

The majority of respondent belong to post graduate level (73.4%), indicating higher maturity and potential awareness regarding menstrual hygiene practices (Table 1).

**Table 1: Frequencies of academic level.**

Academic level	Counts	Percent
Post graduate	177	81.19
Undergraduate	41	18.80

The surveyed students belong to different age groups. The age categories classified into four classes. In these age groups between 21 to 23 years of age class students found the highest and 27 and above class found the lowest (Table 2). Calculated mean age using grouped midpoints found mean age 21.7 years. The respondents are predominantly young adults, reflecting the typical demographic composition of higher educational institutions.

**Table 2: Frequencies of age.**

Age in years	Counts	% of Total	Cumulative %
18 to 20	56	25.7	25.7
21 to 23	156	71.6	97.2
24 to 26	5	2.3	99.5
27 and above	1	0.5	100.0

Out of the total female students, there were 129 students are staying in hostels, 22 in home and 67 living in private accommodations which includes rent and paying guest facilities. The residents constitute highest in hostels (59.2%), emphasizing the importance of institutional sanitation facilities (Table 3).

**Table 3: Frequencies of living place.**

Living place	Counts	% of Total	Cumulative %
Home	22	10.1	10.1
Hostel	129	59.2	69.3
Private accommodations	67	30.7	100.0

### Menstrual cycle characteristics

The cycle of period among students shows that total 2.75% don't track their regularity, 23.85% found irregular and 73.39% have regular. Most respondent reported regular menstrual cycles; however, irregular cycles among nearly one fourth of respondent indicate potential health concerns (Table 4).

**Table 4: Frequencies of menstrual cycle regularity.**

Menstrual cycle regularity	Counts	% of Total	Cumulative %
Don't track	6	2.75	2.75
Irregular	52	23.85	26.60
Regular	160	73.39	100.00

The period days classified into four classes and the result shows that 16.1% between 1 to 3, 51.4% 3 to 5 days, 27.1% between 5 to 7 days and 5.5% found between more than 7 days. Mean duration found 4.8 days. The average menstrual duration falls within the global normal range (Table 5).

**Table 5: Frequencies of period days.**

Period days	Counts	% of Total	Cumulative %
1 to 3	35	16.1	16.1
3 to 5	112	51.4	67.4
5 to 7	59	27.1	94.5
More than 7	12	5.5	100.0

Sanitary pads are overwhelmingly preferred, reflecting limited awareness and adoption of sustainable alternatives. The menstrual products used are only 3.7% use menstrual cups, 95% use sanitary pads and 1.4% uses both (Table 6). Similar observations were reported in previous studies indicating that sanitary pads remain the dominant menstrual product in India because of greater availability and social familiarity, while awareness and adoption of sustainable alternatives such as menstrual cups remain low.

**Table 6: Frequencies of hygiene products used.**

Hygiene products used	Counts	% of Total	Cumulative %
Menstrual cups	8	3.7	3.7
Sanitary pads	207	95.0	98.6
Sanitary pads, menstrual cups	3	1.4	100.0

The changes of pads during a day classified into 6 categories and found that 53.21% in the category every 4 to 6 hrs. within a day, 27.06% between every 2 to 4 hrs., 11.47% more than 6 hrs., 7.34% changes only when necessary and 0.92% more than 6 hours. Using midpoint interval mean pad change interval found 4.9 hours. Most respondents follow hygienic intervals for pad changing; however, 18.81% delay in replacement beyond recommended time, increasing infection risk (Table 7).

**Table 7: Frequencies of sanitary pad change during a day.**

Sanitary pad change during a day	Counts	% of Total	Cumulative %
Every 2-4 hours	59	27.06	27.06
Every 4-6 hours	116	53.21	80.27
Every 6 hours	2	0.92	81.19
More than 6 hours	25	11.47	92.66
Only when necessary	16	7.34	100.00

**Sanitary pad disposal practices**

The disposal of sanitary pads is a major concern. The result shows that 64.68% disposes separate waste bins, 30.73% disposes regular dustbins, 3.67% flash, 0.92% throwing in toilets (Table 8). Although, the majority follow safe disposal practices, 5% unsafe disposal (flushing/toilet disposal) indicates infrastructure gaps and awareness issues which can lead to sewer blockage, water contamination and increased maintenance cost etc. Infrastructure availability is uneven, with strong safety features such as door locks but weak sanitation bins. About 86% dissatisfaction rate indicates severe sanitation management issues. Toilet avoidance is a critical behavioural indicator of sanitation failure that found about 64% of respondents avoided using campus toilets during menstruation that can lead to urinary tract infections, reduced academic participation and physical discomfort. These behavioural outcomes highlight the strong relationship between sanitation infrastructure and health outcomes.

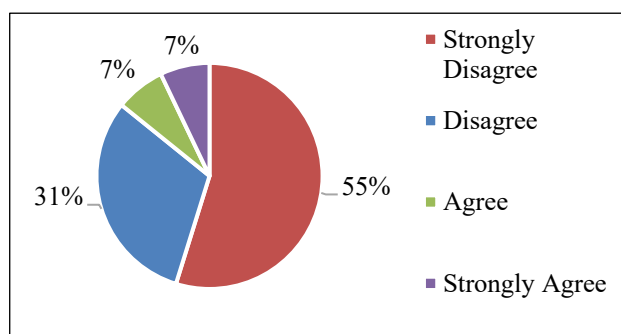
**Sanitation infrastructure and satisfaction**

The results signify the dissatisfaction regarding the consistent cleanliness of their respective schools and colleges. Where 55% respondent strongly disagreed about the washroom’s cleanliness, 31% respondent disagreed, 14% respondent agreed. Overall, according to 71%

respondents, the institution has provided facilities for safe waste disposal, whereas, 29% of respondents denied it about no such facilities are provided (Figure 1).

**Table 8: Frequencies of disposal of pads.**

Disposal of pads	Counts	% of Total	Cumulative %
Flush	8	3.67	3.67
Regular dustbins	67	30.73	34.40
Separate sanitary waste bins	141	64.68	99.08
Toilets	2	0.92	100.00



**Figure 1: Sanitation facilities of institutions and satisfaction.**

**Composite indicators**

Composite indicators provide overall institutional preparedness evaluation that included Menstrual Hygiene Awareness Index (MHAI), Infrastructure Adequacy Index (IAI) and Sanitation Satisfaction Index (SSI) (Table 9). The composite index visualization indicating a substantial gap between infrastructure availability and user satisfaction. This disparity highlights the importance of not only providing facilities but also maintaining them effectively.

**Table 9: Score of composite indicators.**

Indicators	Score (%)	Interpretation
MHAI	68	Moderate awareness exists, but behavioral improvement is still necessary
IAI	62	Moderately adequate but insufficient
SSI	34	Low satisfaction signals urgent need for sanitation reforms

**Correlation analysis**

Correlation analysis revealed a strong negative correlation between washroom cleanliness and toilet avoidance ( $r=-0.61$ ), indicating that poor sanitation

conditions significantly influence behavioural avoidance among students. Moderate positive correlation was observed between water availability and hygiene

practices ( $r=0.42$ ), suggesting infrastructural influence on sanitation outcomes (Table 10).

**Table 10: Correlation analysis between key variables.**

Variables	Water availability	Washroom cleanliness	Toilet avoidance	Disposal practice	Pad change frequency
<b>Water availability</b>	1	0.42	-0.38	0.29	0.31
<b>Washroom cleanliness</b>	0.42	1	-0.61	0.33	0.4
<b>Toilet avoidance</b>	-0.38	-0.61	1	-0.27	-0.35
<b>Disposal practice</b>	0.29	0.33	-0.27	1	0.36
<b>Pad change frequency</b>	0.31	0.4	-0.35	0.36	1

## DISCUSSION

The present study examined menstrual health practices, sanitation infrastructure and hygiene behaviour among 218 female students in Dibrugarh district, Assam. The findings indicate both improvements and persistent gaps in menstrual hygiene management within educational institutions. The study found that about 73.39% of respondents reported regular menstrual cycles, while 23.85% experience irregular cycles. Similar findings were reported in previous studies conducted among female students or women in India. The average menstrual duration in the study was 4.8 days which falls within the normal physiological range reported by WHO guidelines.<sup>3</sup> The study also identified significant concerns regarding sanitary pad disposal practices. Unsafe disposal practices resultant to sewer blockage, water contamination environmental pollution etc.<sup>5,16</sup> The composite indicators further highlighted gaps between infrastructure availability and user satisfaction. While the IAI score of 62% indicates basic facilities exist, but the SSI score of 34% reveals deep dissatisfaction. The finding reveals that about 64% of students avoid campus toilets during menstruation is alarming and consistent with studies from other Indian states.<sup>16</sup> Toilet avoidance can lead to health issues. While 64.68% used separate waste bins, unsafe disposal by nearly 5% poses environmental risk. The findings highlights that Dibrugarh has a better infrastructure compared to other districts, however, user satisfaction level remains low. This suggest that policy focus must shift from provision to maintenance. Regular cleaning, even and working vending machine distribution in all institutes, mandate menstrual friendly infrastructure, helpline within universities and colleges for emergency pad specially during examination, awareness of long-term unhygienic practices and health risks, open discussion on physical and psychological problems, waste problems etc. can be major recommendations for proper management.

This study has certain limitations. The research was limited to selected higher educational institutions of Dibrugarh and therefore findings may not represent all educational institutions in Assam. The study relied on self-reported responses, which may involve recall bias or

desirability bias. In addition, the cross-sectional design limits the ability to establish casual relationships between sanitation infrastructure and menstrual hygiene behaviour. Despite these limitations, the study provides important insights into menstrual hygiene management and sanitation conditions among female students in higher educational institutions.

## CONCLUSION

This study examines the Menstrual Health and Hygiene (MHM) in selected educational institutions of Dibrugarh districts, Assam, focusing on institution's availability of sanitation facilities, and menstrual hygiene awareness among students. The study assessed various indicators including availability and cleanliness of female washrooms, access to water, disposal facilities, emergency support systems, and awareness initiatives. The findings reveal that SSI of 34% reflects urgent need for improved maintenance and hygiene management. While most institutions provide washrooms and water supply, a significant gap remain in cleanliness, inclusive facilities for students with disabilities, and proper waste disposal mechanisms. The moderate infrastructure adequacy index (62%) highlights the necessity for targeted investment in menstrual waste management and sanitation services. Although use of sanitary pads is largely available, access to menstrual cups is very less and vending machines are not universally installed. Awareness programs and workshops on menstrual health are conducted inconsistently across institutions, highlighting an educational gap. To improve menstrual hygiene management, institutions must go beyond product distribution and prioritize menstrual-friendly infrastructure, inclusive sanitation facilities, regular maintenance, and continuous awareness programs. Strengthening teacher involvement, establishing support systems such as helplines, and ensuring regular availability of good-quality menstrual products can significantly enhance students' well-being and educational experience. Addressing these gaps will contribute not only to better health outcomes but also to greater gender equality and dignity for menstruating students.

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## REFERENCES

1. United Nations Children's Fund. Guidance on menstrual health and hygiene, 2019. Available at: <https://www.unicef.org/media/91341/file/UNICEF-Guidance-menstrual-health-hygiene-2019.pdf>. Accessed 01 January 2026.
2. World Health Organization. Safe management of wastes from health-care activities, 2014. Available at: <https://www.who.int/publications/i/item/9789241548564>. Accessed 01 January 2026.
3. World Health Organization. Adolescent Health and Development, 2021. Available at: <https://www.who.int/news-room/questions-and-answers/item/adolescent-health-and-development>. Accessed 01 January 2026.
4. Ministry of Health and Family Welfare, Government of India. Menstrual Health in India: An Update. Available at: <https://nhm.gov.in/index1.php%3Fflang%3D1%26level%3D3%26sublinkid%3D1021%26lid%3D391>. Accessed 01 January 2026.
5. Robinson HJ, Barrington DJ. Drivers of menstrual material disposal and washing practices: A systematic review. *PloS one*. 2021;16(12):e0260472.
6. Durairaj T, Aparnavi P, Narayanan S, Mahantshetti S, Dhandapani S, Shanmugam J, et al. Utilization of modern menstrual methods and related unmet needs among college going women in Coimbatore district: a descriptive cross-sectional study. *BMC Women's Health*. 2024;24(1):78.
7. Irwin N, Burnett KM, McCarron PA. Association between attendance and overall academic performance on a module within a professional pharmacy degree. *Curr Pharm Teach Learning*. 2018;10(3):396-401.
8. Subramaniam BS, Hande S, Komattil R. Attendance and achievement in medicine: Investigating the impact of attendance policies on academic performance of medical students. *Ann Med Heal Sci Res*. 2013;3(2):202.
9. Thatcher A, Fridjhon P, Cockcroft K. The relationship between lecture attendance and academic performance in an undergraduate psychology class. *South Afr J Psychol*. 2007;37(3):656-60.
10. Sommer M, Hirsch JS, Nathanson C, Parker RG. Comfortably, safely, and without shame: defining menstrual hygiene management as a public health issue. *Am J Publ Heal*. 2015;105(7):1302-11.
11. Sood S, Stevens S, Okumura M, Hauer M, Ramaiya A. A Systematic Review of Menstrual Health and Hygiene Management (MHHM) as a Human Right for Adolescents Girls. *Int J Sex Health*, 2022;34(3):483-502.
12. Asumah MN, Abubakari A, Gariba A. Schools preparedness for menstrual hygiene management: a descriptive cross-sectional study in the West Gonja Municipality, Savannah Region of Ghana. *BMJ Open*. 2022;12(4):e056526.
13. WaterAid India. Menstrual hygiene matters: A resource for improving menstrual hygiene around the world. 2015; New Delhi: WaterAid.
14. Government of India. Ministry of Drinking Water and Sanitation. Available at: <https://swachhbharatmission.ddws.gov.in/>. Accessed on 15 March 2026.
15. Swachh Bharat Mission Guidelines. New Delhi: Government of India. Available at: <https://swachhbharatmission.ddws.gov.in>. Accessed on 15 March 2026.
16. Shantanu S. Menstrual hygiene preparedness among schools in India. *Int. J. Environ. Res. Public Health*. 2020;17:647.
17. Jamal S, Singh S. Menstrual health index: a novel approach to assess safe menstrual practices in adolescents and young adults. *J Obstetr Gynecol India*. 2023;73(3):270-8.

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