

## Knowledge, Attitude and Practice regarding Menstrual cup Use among Medical and Paramedical Students and Staffs: A Cross-Sectional Study from Eastern India

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### ARTICLE CYCLE

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### ABSTRACT

**Background:** Menstrual cups are a safe and sustainable option for menstrual hygiene management, yet their uptake remains limited in India. **Aims & Objectives:** To assess knowledge, attitudes, and practices (KAP) regarding menstrual cup use among medical and paramedical students and staff at a tertiary medical college in Odisha, Eastern India. **Methodology:** A cross-sectional study was conducted among females aged 18–45 years using simple random sampling. Data were collected through a semi-structured questionnaire administered via Epicollect-5. Knowledge was measured using a nine-item score and categorized as poor, average, or good. Attitudes and practices were assessed using structured questions. Data were analyzed using SPSS version 27.0. **Results:** Of 582 approached, 538 were analyzed. Awareness was reported by 79%, but only 15.6% demonstrated good knowledge. MBBS students had significantly higher knowledge scores than Allied Health Sciences participants ( $5.15 \pm 1.93$  vs.  $2.93 \pm 2.68$ ;  $p < 0.001$ ), while the latter expressed more favorable attitudes. Sanitary pads were the predominant product (96.9%), and only 2.2% reported current MC use. **Conclusion:** Despite high awareness, menstrual cup use remains low. Targeted educational and behavior change interventions are warranted to improve knowledge and MC use.

### KEYWORDS

Menstrual Cup, Menstrual Hygiene, India

### INTRODUCTION

Globally, over 800 million women menstruate daily, yet menstruation remains surrounded by stigma and socio-cultural restrictions in many low- and middle-income countries (LMICs) (1, 2). Menstrual hygiene management (MHM) includes using safe absorbents, access to water and sanitation, privacy, safe disposal, accurate information, and supportive environments (3). Inadequate MHM has been linked to infections, psychosocial stress, reduced educational and work participation, and poorer quality of life (4).

In LMICs like India, menstruation is largely managed using disposable sanitary pads due to government schemes and commercial availability (5). Although an improvement over traditional absorbents, pads involve recurring costs, supply dependence, discomfort, and disposal challenges, particularly in rural and underserved areas (6,7).

The menstrual cup (MC), made of medical-grade silicone, is a reusable and cost-effective alternative lasting up to

10 years and wearable for up to 12 hours (8). Despite these advantages, uptake in LMICs remains low, influenced by socio-cultural and attitudinal barriers (9). A scoping review among nulliparous women reported concerns about insertion, pain, virginity, and stigma as key deterrents (10). Therefore, this study assessed knowledge, attitudes, and practices (KAP) regarding menstrual cup use among women in educational institutions in Odisha, Eastern India, to inform culturally appropriate interventions and policies.

### Aim & Objective(s):

- To assess the knowledge, attitudes, and practices (KAP) regarding menstrual cup use among medical and paramedical students and staff in a tertiary medical college in Odisha, Eastern India.

### MATERIAL & METHODS

**Study Design and Study Setting:** This cross-sectional study was conducted at a tertiary medical college in Odisha, Eastern India.

**Study Population:** All females aged 18 to 45 years who are medical students, paramedical students, and paramedical staff.

**Study Duration:** It was an observational study carried out over two years, from October 2022 to November 2024.

**Sample Size Calculation:** The sample size was calculated using the standard formula for estimating a proportion:  $n = Z^2 p(1-p)/d^2$ , where  $n$  is the required sample size,  $Z$  is the standard normal deviate at 95% confidence level (1.96),  $p$  is the estimated proportion of participants with good knowledge regarding menstrual cups, and  $d$  is the absolute precision. Based on a previous study by Sudevan Devan GM et al. (2022), the proportion with good knowledge was 26.3% ( $p = 0.263$ ) (11). Assuming a relative precision of 15%, the absolute precision was calculated as  $d = 0.15 \times 0.263 = 0.039$ . Substituting these values, the estimated minimum sample size was 497. After adjusting for an anticipated exclusion rate of 5% and a non-response rate of 10%, the final sample size was increased to 582. Simple random sampling was employed to select the 582 participants from the available sampling frame list of medical and paramedical students and staffs list.

**Inclusion and Exclusion Criteria:** Females aged 18 to 45 years who were medical or paramedical students or staff were included. All individuals who declined consent, or those who had undergone surgical or physiological menopause were excluded from the study.

**Strategy for Data Collection:** Selected participants were approached at the college or their homes after administrative approval. Written informed consent was obtained before data collection began. Data were gathered using a semi-structured questionnaire hosted on Epicollect-5, a mobile data collection application.

**Working Definitions:**

(i) Ever use of Menstrual cup: Have used at least once during menstruation period (12).

(ii) Current use of Menstrual cup: Use of menstrual cup for a duration of three or more months.

**Assessment of Knowledge, Attitude and Practice MC use**  
 Knowledge regarding menstrual cups was assessed using nine specific multiple-choice questions. These questions covered key aspects of usage and maintenance: material composition, mechanism of action, emptying frequency, lifespan, sterilization method, and usability during swimming, postpartum, by virgins, or as a contraceptive. Responses were scored using a predefined scoring system. Each correct response was assigned a score of 1, while incorrect responses and "I don't know" options were assigned a score of 0. The total possible knowledge score ranged from 0 to 9. Based on the cumulative score, participants were categorized into three knowledge levels: poor knowledge (scores 0–4; <50%), average knowledge (scores 5–6; 50–75%), and good knowledge (scores 7–9; >75%) (11)

Attitudes and practices related to menstrual cup use were assessed using a structured, self-administered questionnaire developed based on literature review and expert input. Attitude was evaluated across key domains, including perceived safety, perceived ease of use, willingness to use, and willingness to recommend menstrual cups as a menstrual hygiene management (MHM) option. Practices were assessed by documenting

participants' current menstrual hygiene product, prior experience with menstrual cup use, and current usage status. Current use was operationally defined as use of a menstrual cup for at least the last three consecutive menstrual cycles to distinguish sustained use from trial use. All variables were recorded as categorical measures and summarized using appropriate descriptive statistics to assess patterns of menstrual cup adoption.

**Ethical Issues and Informed Consent:** The study received ethical approval from the Institute Ethics Committee of SOA University, Bhubaneswar (Ref No: IEC/IMS.SH/SOA/2022/427), dated October 14, 2022. Written informed consent was obtained from all participants before data collection.

**Data Analysis Software:** Microsoft excel was used for data cleaning and was analysed using SPSS version 27.0.

**RESULTS**

A total of 582 participants were approached for data collection. Of these, 42 participants did not provide consent to participate, and two were excluded due to premature menopause. Consequently, 538 participants were included in the final analysis. The mean age of the participants was 23.4 years (SD = 4.2), with ages ranging from 18 to 45 years. In terms of marital status, 89% were unmarried, and 11% were married. Over the past 10 years, 55% of participants resided in urban areas, 31% in rural areas, and 14% in semi-urban areas. Nuclear families constituted 68% of households, whereas 32% belonged to joint families. Mothers' education levels included 45% with graduate or higher degrees and 26% with high school completion. Heads of families comprised 35% graduates and 27% with professional degrees. Professional occupations accounted for 39% of heads of families. The religion distribution included 96 % Hindu participants, 3.5% Christians, 0.6% Muslims, and 0.4% other participants respectively. Caste distribution showed 59% from the general category, followed by 25% OBC, 11% SC and 4.6% ST individuals.

A total of 538 participants were included in the study, comprising 138 MBBS students and 400 Allied Health Sciences students and staffs. Overall, 424 (79%) participants had heard of menstrual cups and 433 (80%) had seen an image of the MC. The most common source of information was social media or the internet (268, 62%), followed by family or friends (90, 21%) and healthcare providers or medical books (60, 13.9%). Regarding specific knowledge, 322 (60%) participants correctly identified that menstrual cups collect menstrual blood. However, knowledge gaps were noted, with 233 (43%) unaware of the material, 234 (43%) unaware of the recommended emptying frequency, and 293 (54%) unaware of the lifespan. Similarly, 270 (50%) participants did not know the correct sterilization method, and 263 (49%) were unsure whether menstrual cups could be used during swimming or bathing (Table 1). A large proportion of participants reported uncertainty regarding emptying frequency, postpartum use, and use during bathing or swimming. Self-rated knowledge was predominantly poor to average. The distribution of overall objective knowledge scores is illustrated in Figure 1.

Overall, 15.6% of participants demonstrated good knowledge regarding menstrual cups. The mean (SD) knowledge scores out of a maximum of 9 was significantly higher among MBBS students compared to Allied Health Sciences students and staff ( $5.15 \pm 1.93$  vs.  $2.93 \pm 2.68$ ;  $p < 0.001$ ), with a higher median score observed in the MBBS group (5.00 vs. 3.00). A greater proportion of MBBS students had good knowledge (26%) and average knowledge (41%) compared to Allied Health Sciences students and staff (12% and 21%, respectively), whereas poor knowledge was substantially more common among Allied Health Sciences students and staff (67% vs. 33%;  $p < 0.001$ ) (Table 2). This disparity in knowledge scores between the two study streams is illustrated in Figure 2. Attitudes toward menstrual cup use differed significantly between the two groups. A higher proportion of MBBS students perceived menstrual cups as safe compared to Allied Health Sciences students and staffs (99, 72% vs. 178, 45%;  $p < 0.001$ ), while uncertainty regarding safety was more common among Allied Health Sciences students and staffs (182, 46% vs. 27, 20%). Despite having

higher knowledge scores, MBBS students demonstrated comparatively less favourable attitudes toward menstrual cup use than Allied Health Sciences students and staffs. A significantly higher proportion of Allied Health Sciences students and staffs expressed willingness to use a menstrual cup if made available compared to MBBS students (68% vs. 49%,  $p < 0.001$ ). Similarly, Allied Health Sciences students and staffs were more likely to recommend menstrual cups to others (77% vs. 64%,  $p < 0.001$ ). In contrast, uncertainty and unwillingness to use menstrual cups were more common among MBBS students (Table 3).

Sanitary pads were the most commonly used menstrual hygiene product, reported by 521 (96.9%) participants, followed by menstrual cups (12, 2.2%), tampons (4, 0.7%), and cloth (1, 0.2%). Overall, 20 (3.7%) participants had ever used or attempted to use a menstrual cup. Among these, 12 (60%) reported current use for at least the last three consecutive menstrual cycles, while 8 (40%) were not current users (Table 4).

**Table 1: Assessment of Knowledge Regarding Menstrual Cup**

Questions regarding Knowledge of MC	N	Response	n (%)
Heard of menstrual cup?	538	Yes	424 (79%)
Seen an image of menstrual cup?	538	Yes	433 (80%)
Source of information about cup	433	Family or friends	90 (21%)
		Medical books / Healthcare provider	60 (13.9%)
		Social media / Internet	268 (62%)
		News / Print media	12 (2.8%)
		Others	3 (0.7%)
Material of menstrual cup	538	I don't know	233 (43%)
		Microfiber	11 (2.0%)
		Rubber/Latex	135 (25%)
		Silicone	159 (30%)
Mechanism of action MC	538	Absorption	42 (7.8%)
		Collection	322 (60%)
		I don't know	174 (32%)
Emptying frequency of MC	538	After every 12 hrs	77 (14%)
		After every 5–6 hrs	210 (39%)
		After 1 day	17 (3.2%)
		I don't know	234 (43%)
Lifespan of MC	538	Up to 10 years	191 (36%)
		Single use	49 (9.1%)
		For lifelong	5 (0.9%)
		I don't know	293 (54%)
Sterilization method of MC	538	Boil 5–10 minutes	141 (26%)
		Boil 30 minutes	91 (17%)
		Cannot be sterilized	36 (6.7%)
		I don't know	270 (50%)
Can MC be used while swimming/bathing?	538	Yes	221 (41%)
		No	54 (10%)
		I don't know	263 (49%)
Can MC use in postpartum Periods (<6 weeks)?	538	Yes	96 (18%)
		No	98 (18%)
		I don't know	344 (64%)
Can MC be used as a contraceptive method?	538	Yes	40 (7.4%)
		No	255 (47%)
		I don't know	243 (45%)
Can virgins use MC?	538	Yes	286 (53%)
		No	29 (5.4%)
		I don't know	223 (41%)

**Table 2: Attitude and Perception Regarding Menstrual Cup Use by Study Stream**

Characteristic	MBBS (N = 138)	Allied Health Sciences (N = 400)	p-value*
<b>Do you perceive the Menstrual Cup as safe option for MHM?</b>			<0.001
I don't know	27 (20%)	182 (46%)	
No	12 (8.7%)	40 (10%)	
Yes	99 (72%)	178 (45%)	
<b>What do you think about the usage of menstrual cup?</b>			<0.001
Difficult	64 (46%)	101 (25%)	
Easy	48 (35%)	118 (30%)	
I don't know	26 (19%)	181 (45%)	
<b>If a menstrual cup is made available, will you use it?</b>			<0.001
I don't know	31 (22%)	47 (12%)	
No	40 (29%)	83 (21%)	
Yes	67 (49%)	270 (68%)	
<b>Would you recommend the Menstrual Cup to others?</b>			<0.001
I don't know	31 (22%)	37 (9.3%)	
No	18 (13%)	55 (14%)	
Yes	89 (64%)	308 (77%)	

**Table 3: Practices Regarding Menstrual Hygiene Management and Use of MC**

Characteristic	N	Response	n (%)
<b>Current practice of Menstrual Hygiene Management by participants (Primary)</b>	538	Sanitary pads	521 (96.9)
		Tampons	4 (0.7)
		Menstrual cup	12 (2.2)
		Clothes	1 (0.2)
<b>Have you ever used/ tried to use MC as a part of MHM?</b>	538	Yes	20 (3.7)
		No	518 (96.3)
<b>Are u currently* using MC?</b>	20	Yes	12 (60.0)
		No	8 (40.0)

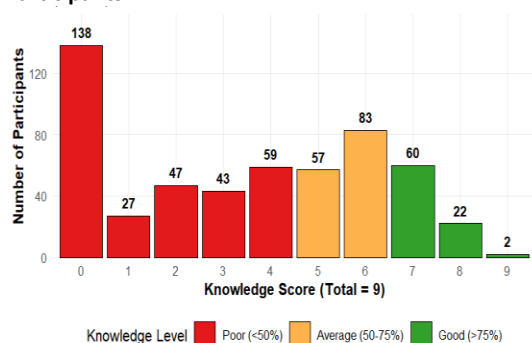
\*Using at least last three menstrual cycle

**Table 4: Comparison of Objective Knowledge Scores and Proficiency Levels between MBBS and Allied Health Sciences Students**

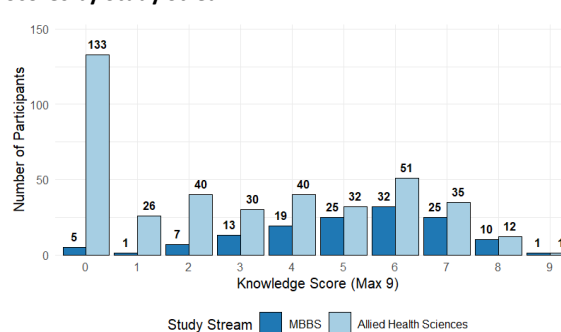
Characteristic	MBBS (n = 138)	Allied Health Sciences (n = 400)	p-value
<b>Knowledge Score (Max = 9)</b>			<0.001
Mean (SD)	5.15 (1.93)	2.93 (2.68)	
Median (Min, Max)	5.00 (0.00, 9.00)	3.00 (0.00, 9.00)	
<b>Knowledge Level</b>			<0.001
Average Knowledge (50–75%)	57 (41%)	83 (21%)	
Good Knowledge (>75%)	36 (26%)	48 (12%)	
Poor Knowledge (<50%)	45 (33%)	269 (67%)	

Notes:<sup>1</sup> Values are presented as n (%) unless otherwise specified; <sup>2</sup> p-values obtained using Wilcoxon rank-sum test for continuous variables and Pearson's Chi-squared test for categorical variables.

**Figure 1: Distribution of Knowledge Scores Among Participants**



**Figure 2: Comparative Distribution of Knowledge Scores by Study Stream**



Note: Allied Health group includes Nursing (n=399) and Pharmacy (n=1)

## DISCUSSION

Menstrual cups are increasingly recognized as a safe, sustainable, and cost-effective menstrual hygiene product; however, their adoption remains limited, particularly in low- and middle-income settings. A recent large meta-analysis across Asian countries reported a pooled prevalence of menstrual cup use of 2.68%, indicating low utilization despite growing awareness (9). In the present study, although overall awareness was relatively high, only 15.6% of participants demonstrated good knowledge, and menstrual cup use remained low, with only 3.7% reporting ever use and 2.2% reporting current use as their primary menstrual hygiene method. These findings are consistent with existing evidence and highlight the persistently low adoption of menstrual cups even among medical and paramedical students and staff. Similarly, the National Family Health Survey-5 (NFHS-5, 2019–21) reported that only 0.3% of females aged 15–24 years used menstrual cups, indicating extremely low utilization at the population level (13). Although the prevalence observed in the present study was comparatively higher, this may be attributed to the healthcare-based study population, who likely had better access to information and exposure through academic and clinical environments. Nevertheless, the overall utilization remained low, suggesting that higher educational background alone may not be sufficient to ensure adoption, and highlighting the need for targeted awareness, behavioral change communication, and supportive interventions.

The present study also demonstrated a complex interplay between knowledge, attitude, and practice. While MBBS students had significantly higher knowledge scores and a greater proportion demonstrated good knowledge compared to Allied Health Sciences students and staff, the latter exhibited a more favorable attitude, with a higher proportion expressing willingness to use menstrual cups if made available and to recommend them to others. Despite relatively high awareness, actual use remained limited, indicating a disconnect between knowledge and practice. Similar gaps have been reported in previous studies, including a recent systematic review by van Eijk et al. (2024), which highlighted that awareness and knowledge do not necessarily translate into adoption (8). This suggests that, in addition to knowledge, factors such as accessibility, perceived ease of use, social acceptance, and supportive environments play a crucial role in influencing menstrual cup uptake.

The continued preference for sanitary napkins observed in this study aligns with previous research and may be attributed to familiarity, convenience, and limited practical exposure to menstrual cups. Studies have identified several barriers to menstrual cup adoption, including inadequate knowledge, fear of insertion, lack of initial guidance, privacy concerns, and prevailing myths and sociocultural taboos related to menstruation. These findings underscore the importance of structured educational interventions, practical demonstrations, and supportive institutional environments to enhance confidence and promote informed adoption of menstrual cups. Such efforts are particularly important among healthcare students, who can serve as future advocates

for menstrual health and contribute to wider community acceptance of sustainable menstrual hygiene practices. The strengths of this study include the use of simple random sampling, a standardized and objective scoring system for knowledge assessment, and digital data collection using Epicollect-5, which enhanced data quality and completeness. However, certain limitations should be considered. The reliance on self-reported responses may introduce social desirability and recall biases. Additionally, as the study was conducted among students and staff of a tertiary medical institution, the findings may have limited generalizability to the broader community, particularly populations with different educational, socio-cultural, and healthcare access profiles.

## CONCLUSION

Despite relatively high awareness, the good knowledge and actual use of menstrual cups were low among medical and paramedical students and staff. Although MBBS students demonstrated higher knowledge, Allied Health Sciences students and staff exhibited more favorable attitudes toward menstrual cup use, highlighting a gap between knowledge and adoption. These findings indicate that menstrual cups remain a relatively new and underutilized menstrual hygiene option in the Indian context. Public health measures are required to address the important concern looking at improving menstrual cup awareness, acceptance, and its uptake in the general population

## RECOMMENDATION

The low proportion of participants with good knowledge and the limited utilization of menstrual cups observed in this study reflect that menstrual cups remain a relatively new in menstrual hygiene option in the Asian, particularly Indian, context. These findings highlight the need for strengthening awareness through structured educational interventions, practical demonstrations, and experiential learning opportunities. Such efforts are especially important among healthcare students, who, as future healthcare providers, can play a critical role in disseminating accurate information, addressing misconceptions, and promoting informed adoption and wider community acceptance of menstrual cups as a sustainable menstrual hygiene solution. Furthermore, prospective community-based studies are warranted to better understand socio-cultural determinants and to design culturally tailored public health interventions aimed at improving menstrual cup awareness, acceptance, and uptake in the general population.

## LIMITATION OF THE STUDY

The reliance on self-reported responses may introduce social desirability and recall biases. Additionally, as the study was conducted among students and staff of a tertiary medical institution, the findings may have limited generalizability to the broader community, particularly populations with different educational, socio-cultural, and healthcare access profiles.

**RELEVANCE OF THE STUDY**

This study provides important insights into the knowledge, attitudes, and practices regarding menstrual cup use among healthcare students and staff, a key population that can influence menstrual health awareness and practices in the wider community. The findings highlight significant gaps between awareness, knowledge, and actual utilization, underscoring the need for targeted educational and behavioral interventions. Given that menstrual cups are a sustainable and cost-effective menstrual hygiene option, improving their acceptance can contribute to better menstrual health outcomes and environmental sustainability.

**AUTHORS CONTRIBUTION**

S.M.B., P.B., and E.V.R. contributed to the conceptualization and definition of intellectual content. S.M.B. and P.B. were responsible for the study design, literature search, clinical and experimental components, and statistical analysis. S.M.B. additionally handled data acquisition. B.K.P. contributed to the definition of intellectual content and data analysis, while M.S.A. assisted with the literature search. All authors (S.M.B., P.B., E.V.R., B.K.P., and M.S.A.) participated in manuscript preparation, editing, and review, and all served as guarantors for the study.

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**CONFLICT OF INTEREST**

There are no conflicts of interest.

**DECLARATION OF GENERATIVE AI AND AI ASSISTED TECHNOLOGIES IN THE WRITING PROCESS**

The authors haven't used any generative AI/AI assisted technologies in the writing process.

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