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Hesitancy on usage of menstrual cup in college going students a cross-sectional mixed method study in Karaikal region of Puducherry

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Research Article

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Abstract

Background: Sanitary napkins are the primary menstrual product being used in India. They are single use and despite the availability of sustainable alternatives like menstrual cups, napkins use remains the more popular choice. The shift in usage to more sustainable menstrual product not just comes with awareness but also the preparedness of future healthcare providers who influence menstrual-health counselling. Evidence on their perceptions remains limited.
Methods: A cross-sectional mixed-methods study was conducted among 292 women aged 18–49 years enrolled in medical, nursing and allied health programs at a tertiary-care institute in Karaikal (November 2023–May 2024). Quantitative data were collected using a semi-structured questionnaire via EpiCollect5 and analysed descriptively using SPSS. Qualitative data were obtained through open-ended interviews with the same participants and analysed using thematic analysis. Findings were integrated during interpretation.
Results: Sanitary pads were used by 93.49% of participants, while only 1.71% had ever used a menstrual cup and 2.74% were current users despite 74.32% awareness. No inferential statistical analyses were conducted. Qualitative analysis identified seven themes: fear and discomfort; lack of knowledge; familial and societal disapproval; accessibility and hygiene challenges; preference for familiar products; reasons for acceptance; and reasons for discontinuation. Integration revealed that awareness alone did not translate into adoption due to emotional, cultural and practical barriers.
Conclusion: The low level of usage of menstrual cup amongst healthcare workers reflects the gap between awareness and the actual practiced behaviour which is driven by fear, misinformation and contextual constraints. More of Informational campaigns are required to bring about the behaviour change, demonstration based training and supportive institutional infrastructure will also help in improving.

Introduction

Menstrual health continues to be an important public-health concern in India. Most government programs still focus on providing free disposable sanitary pads through schools and public facilities (1). While this improves access, it also leads to ongoing costs, waste-management issues, and skin irritation when pads are used for long durations (2). In contrast, menstrual cups are reusable devices made of medical-grade silicone or similar materials and can be safely used for several years, offering both economic and environmental advantages (3, 4). However, despite these benefits, their acceptance and routine use remain low across the country.

Studies from different parts of India have shown that although many women are aware of menstrual cups, very few actually use them, suggesting a clear gap between awareness and behaviour (5, 6). Most of this research has relied only on quantitative data and has focused on general populations or students, which does not explain the deeper reasons behind hesitation. For menstrual-health promotion to be effective, it is important that healthcare providers themselves are comfortable and confident with the products they may recommend, since they play a key role in counselling and behaviour-change

communication (7). Yet there is limited information on whether future healthcare professionals know about menstrual cups, have personal experience using them, or feel prepared to guide others.

To address this gap, the present study explored menstrual-hygiene practices and perceptions regarding menstrual-cup use among medical, nursing, and allied-health students in a tertiary-care teaching hospital. Using a cross-sectional convergent mixed-methods approach, the study described awareness and usage patterns and examined the reasons for hesitancy through thematic analysis. Understanding these barriers at a pre-adoption stage is important for strengthening menstrual-health initiatives, supporting behaviour-change strategies, and integrating sustainable menstrual products into public-health programs.

Methods

Study design: A cross-sectional mixed-methods study was conducted. Quantitative data were collected using a semi-structured questionnaire, and qualitative data were obtained through open-ended interviews. Datasets were analysed separately and integrated during interpretation. Qualitative data were analysed using thematic analysis.

Setting and period: The study was conducted at a tertiary care institute, Karaikal, from November 2023 to May 2024.

Inclusion criteria: Women aged 18–49 years; students enrolled in medical, nursing, and allied health programs.

Exclusion criteria: Individuals those who are not willing.

Sample size: As per NFHS 5 78% of women use menstrual hygiene products, keeping 95% confidence interval, 5% absolute precision, sample size is calculated using the following formula $Z^2(pq/d^2)$. Sample size arrived using above data is 264, considering 10% non-response rate sample size is corrected to be 292.

Data collection: Quantitative data were collected using a semi structured questionnaire administered through EpiCollect5. Qualitative data were collected by in person interview to explore perspectives in greater depth. After obtaining consent, data was collected.

Data analysis: Quantitative data were analysed using SPSS 27, Qualitative data underwent thematic analysis.

Ethics: Ethical approval was obtained from the Institutional Ethics Committee Vinayaka Mission's Medical College and Hospital, Karaikal, Puducherry, India via, approval number IEC/VMMCH/2024/APR/75

All methods were carried out in accordance with relevant institutional guidelines and regulations.

Results

Quantitative findings: A total of 292 women participated in the study, including medical (n=148), nursing (n=92), and allied health students (n=52). The mean age of participants was 20.76 ± 2.7 years, with medical students being slightly older (22 ± 3 years) compared to nursing (20 ± 1 years) and allied students (19 ± 1 years).

Most participants were undergraduates (94.86%), with only 5.14% enrolled in postgraduate programs. The majority were unmarried (97.95%). Nuclear families were predominant (85.62%) across all groups

Regarding residential status, 66.78% were day-scholars, while 33.22% were hostel residents. The most commonly used menstrual product was sanitary napkins (93.49%), followed by cloth pads (4.11%) and menstrual cups (1.71%). Awareness of menstrual cups was high (74.32%), but only 1.71% had ever used one, and current use was reported by just 2.74% of participants No inferential statistical associations were conducted, as the quantitative component was descriptive.

Qualitative findings: Seven themes emerged ; fear and discomfort, lack of knowledge and awareness, familial and societal influence, accessibility and practical barriers, preference for familiar products, reasons for acceptance, and reasons for discontinuation. Integration showed that emotional and contextual factors, non-awareness, determined behaviour.

Table.1 Descriptive Statistics

Course		Medical (n=148)	Nursing (n=92)	Allied (n=52)	Overall (n=292)
		n (%)	n (%)	n (%)	n (%)
Age (mean (SD))		22 (±3)	20(±1)	19 (±1)	20.76 (±2.7)
Education	Undergraduate	133 (89.9)	92 (100)	52 (100)	277 (94.86)
	Postgraduate	15 (10.1)	0 (0)	0 (0)	15 (5.14)
Marital Status	Married	6 (4.1)	0 (0)	0 (0)	6 (2.05)
	Unmarried	142 (95.9)	92 (100)	52 (100)	286 (97.95)
Type of Family	Joint-Family	23 (15.5)	15 (16.3)	4 (7.7)	42 (14.38)
	Nuclear Family	125 (84.5)	77 (83.7)	48 (92.3)	250 (85.62)
Current Residential Status	Day-Scholar	87 (58.8)	70 (76.1)	38 (73.1)	195 (66.78)
	Hosteler	61 (41.2)	22 (23.9)	14 (26.9)	97 33.22)
Preferred Sanitary product	Sanitary Napkin	137 (92.6)	87 (94.6)	49 (94.2)	273 (93.49)
	Tampon	1 (0.7)	0 (0)	0 (0)	1 (0.34)
	Cloth Pad	4 (2.7)	5 (5.4)	3 (5.8)	12 (4.11)
	Menstrual Cup	5 (3.4)	0 (0)	0 (0)	5 (1.71)
Have you heard about menstrual cup	Yes	125 (84.5)	59 (64.1)	33 (63.5)	217 (74.32)
	No	22 (14.9)	33 (35.9)	19 (36.5)	75 (25.68)
Have you used menstrual cup	Yes	17 (11.5)	3 (3.3)	1 (1.9)	21 (7.19)
	No	131 (88.5)	89 (96.7)	51 (98.1)	271 (92.81)
Are you currently using menstrual cup	Yes	7 (4.7)	0 (0)	1 (1.9)	8 (2.74)
	No	141 (95.3)	92 (100)	51 (98.1)	284 (97.26)

Table 2 : Reason for not opting to use menstrual cup		
THEME	SUB THEME	VERBATIM
Fear and discomfort	Fear of Pain	Verbatim 1.1.1“ I feel it will be painful” Verbatim 1.1.2 “Iam scared that the process of insertion will be painful”
	Fear of bleeding	Verbatim 1.2.1 “I have a fear that insertion of a menstrual cup will lead to more bleeding”
	Fear of leakage	Verbatim 1.3.1 “I fear that blood will leak out of the cup”
	General Discomfort	Verbatim 1.4.1 “I think it will be uncomfortable to use”
Lack of knowledge	Lack of knowledge about the usage	Verbatim 2.1.1 “I don’t know how to use the product well”
Fear of losing virginity (Hymenal tear)		Verbatim 3.1.1 “Im scared I will lose my virginity” Verbatim 3.1.2 “I fear it will be painful and will damage my hymen”
Familial and Societal influence	Familial disapproval	Verbatim 4.1.1 “My family members do not allow me to buy anything else apart from sanitary napkins” Verbatim 4.1.2 “My mother does not allow me to use menstrual cup” Verbatim 4.1.3. “My parents done think menstrual cups are safe to use”
Accessibility and practicality		Verbatim 5.1.1 “Menstrual cups aren’t available readily at the local shops” Verbatim 5.1.2 “It is difficult to use on a daily basis”

Table 3 : Reasons for choosing preferred hygiene products

THEME	SUB THEME	VERBATIM
Familiarity and Habit	long term use	Verbatim 1.1.1“ I have been using sanitary pads since the beginning”
	family influence	Verbatim 1.2.1 “My mother has taught me to use sanitary pads ever since I started getting periods” Verbatim 1.2.2 “Everybody in my family uses sanitary pads”
Comfort and Convenience	Ease of use	Verbatim 2.1.1 “ It is comfortable and easy to use “
	Availability	Verbatim 2.2.1 “It is easily available in all stores (Sanitary pads)”
	Lack of side effects	Verbatim 2.3.1 “Sanitary pads don’t have any side effects”
	Reluctance to change	Verbatim 2.4.1 “Iam comfortable with what I use and Iam unwilling to change to any other sanitary product”
Effectiveness	General effectivity of the product	Verbatim 3.1.1 “Sanitary pads have good flow retention” Verbatim 3.2.1 “They absorb really well” Verbatim 3.3.1 “Cotton pads are re-usable and don’t give rashes”
Lack of Awareness	Limited knowledge about alternative menstrual hygiene products	Verbatim 4.1.1 “Iam unaware of any other sanitary product” Verbatim 4.2.1 “I only know about sanitary pads”
Affordability	Cost considerations	Verbatim 5.1.1 “Cloth pads are cheap and can be re-used” Verbatim 5.2.1 “They are budget friendly”

Table 4 : Reasons for rejecting menstrual cups post-Demonstration

THEME	SUB THEME	VERBATIM
Fear and Discomfort	Fear of insertion	Verbatim 1.1.1 “Iam not comfortable with the idea of insertion” Verbatim 1.1.2 “I don’t like the idea of insertion”
	Fear of pain	Verbatim 1.2.1 “It sounds painful” Verbatim 1.2.2 “I think the insertion will be painful”
	Fear of Injury	Verbatim 1.3.1 “I have a feeling I’ll end up injuring myself”
Skepticism and Mistrust	Doubts about effectiveness	Verbatim 2.1.1 “I feel like it would fall out”
	Hygiene concerns	Verbatim 2.2.1 “I idea of re-using is not impressive”
	Difficulty in disposal	Verbatim 3.1.1 “The disposal of the contents seem like a hassle”
Comfortable with existing methods	Preference for already using product	Verbatim 4.1.1 “I am comfortable with sanitary napkins” Verbatim 4.1.2 “I find sanitary napkins more comfortable”

Table 5 : Reasons for using menstrual cup

THEME	SUB THEME	VERBATIM
Practical Benefits	Cost effectiveness	Verbatim 1.1.1 “Menstrual cups are cost effective, during heavy flow you have to change only once per day” Verbatim 1.1.2 “It lasts longer and is economical in the longer run”
	Leakage Control	Verbatim 1.2.1 “I was having troubles with leakage and menstrual cups contain the leakage well” Verbatim 1.2.2 “I wanted to stop staining my clothes”
	Travel and mobility	Verbatim 1.3.1 “It is helpful in long journey where changing facility is not available” Verbatim 1.3.2 “It is useful in long hours of work without access to washrooms”
Health and hygiene		Verbatim 2.1 “It is comfortable and eco-friendly” Verbatim 2.2 “Sanitary pads cause rashes, whereas menstrual cups do not”
Environmental Awareness		Verbatim 3.1 “To reduce plastic waste from disposable pads” Verbatim 3.2 “It is an environmental friendly option-less waste is generated”
Curiosity	Experimentation	Verbatim 4.1.1 “I was curious to try on a new product” Verbatim 4.1.2 “I heard about it from everyone and wanted to try it”
	Desire to switch	Verbatim 4.2.1 “I wanted to try a new hygienic product”
Influence of others	Peer influence	Verbatim 5.1.1 “My friend recommended using it”
	Social media influence	Verbatim 5.2.1 “I saw influencers using it on social media”

Tables 6 : Reasons for Discontinuing menstrual cups		
THEME	SUB THEME	VERBATIM
Physical discomfort	Pain during insertion	Verbatim 1.1.1 “I was unable to insert it at times due to pain during insertion”
	pain during removal and inability to smoothly remove	Verbatim 1.2.1 “Had a bad experience when I tried to remove it” Verbatim 1.2.2 “It got stuck while I tried to remove it, it was a scary experience”
Inconvenience of usage	Inconvenient environment	Verbatim 2.1.1 “It is not convenient to use in a college environment” Verbatim 2.1.2 “Disposal is difficult during unavailability of adequate washroom facilities”
	Inconvenient re-usal	Verbatim 2.2.1 “It is difficult to boil and wash while living in hostel”
Fear and Anxiety	Fear of leakage	Verbatim 3.1.1 “There is fear of overflow, and wrong insertion technique”
	anxiety about incorrect usage	Verbatim 3.2.1 “Wrong insertion technique can lead to harm hence I stopped using it”

Discussion

This mixed-methods study among women aged 18–49 years enrolled in medical, nursing and allied health courses at a tertiary-care institute in Karaikal analysed the menstrual hygiene practices and factors influencing usage of menstrual cups and the reasons for hesitancy in the same. Quantitative findings showed that, their menstrual hygiene practices remained strongly oriented towards conventional sanitary pads, with more than 93.49% reporting pad use and only 1.71% having ever used a menstrual cup; current use was as low as 2.74%. Despite relatively high awareness of menstrual cups (74.3%), adoption remained low, suggesting a substantial gap between awareness and actual behaviour. The qualitative findings helped explain why awareness did not translate into use. Many participants described worries about pain, inserting or removing the cup, bleeding, leakage, and possible damage to the hymen. Several also felt they did not have enough practical guidance on how to use a cup confidently. In addition, family restrictions, discomfort discussing menstrual products at home, and concerns about privacy and washing facilities in hostels and college settings made adoption even more difficult. At the same time, those who had tried or continued using menstrual cups reported clear advantages, including lower long-term cost, better control over leakage, convenience during travel or long working hours, improved comfort, and reduced waste. These contrasting experiences highlight that strong fears and hesitation can exist alongside an understanding of the potential benefits, which may explain why many students remain unsure about switching to menstrual cups despite being aware of them.

The findings of this study are consistent with earlier research from India showing a persistent gap between awareness and actual menstrual cup use; however, the current study advances existing evidence in several important ways. Previous studies among medical students in Mysuru reported high awareness (98%) but low usage (6.47%), yet were limited to quantitative assessment and could not explain the underlying reasons for hesitation (5). Similarly, the North Indian study from AIIMS Bathinda identified extremely low usage (1.2%) and highlighted inadequate knowledge as the predominant barrier, but the absence of qualitative inquiry restricted understanding of how fears, norms, and social influences shaped behaviour (6). In contrast, the present study not only documents a comparable awareness use gap (74.3% vs. 2.7%) but addresses this unanswered question by integrating qualitative findings from the same participants, enabling explanation rather than description. While evidence from Kerala suggests that acceptance improves after counselling (4), existing studies focus on post-intervention or healthcare-professional groups. The current research fills a critical gap by examining pre-adoption perceptions among young women in training, representing a population positioned to influence future menstrual health norms. Additionally, unlike national-level commentaries that emphasize policy-level barriers (7), this study identifies modifiable barriers at the individual and institutional levels, offering actionable insights for early-stage intervention before behaviour is formed.

The persistence of low menstrual cup adoption despite adequate awareness in this study highlights the complex interaction between knowledge, cultural embodiment, and perceived bodily vulnerability among young women in training. The qualitative themes suggest that decision-making around menstrual products is not merely informational, but rooted in notions of bodily integrity, sexuality, and social acceptability

These findings indicate that normalizing menstrual cup usage was difficult to achieve, just through information and awareness. Cognitive awareness does not override emotional, relational, and socio-cultural discomfort. The coexistence of apprehension and recognition of benefits observed in this study reflects an “ambivalence threshold,” where participants acknowledge advantages yet remain unwilling to transition due to perceived risk, stigma, and institutional constraints such as hostel facilities.

The relatively large sample size (n = 292) and focus on medical, nursing, and allied health students further enhance the relevance of findings, as this group represents future healthcare providers capable of influencing menstrual health norms and counselling practices. The qualitative component adds depth by identifying previously under-represented determinants such as parental restriction, hymenal anxiety, and hostel-based feasibility concerns. There are limitations to this study as it is a single-centre study, and chance of recall and social desirability biases are there. We have made efforts like maintaining privacy during interviews and assuring anonymity to reduce biases. Despite these limitations, the mixed-methods approach will make this study as a meaningful contribution to understanding menstrual cup acceptability in Indian women.

The findings of this study indicate that improving menstrual cup acceptability will require a multi-level approach rather than isolated awareness efforts. At the individual level, interventions should focus on

confidence-building through demonstration-based training, peer support, and opportunities for supervised familiarization, particularly for first-time users who experience anxiety related to insertion and bodily harm. At the institutional level, colleges and hostels may play a critical enabling role by ensuring access to private washing facilities and integrating menstrual product counselling into student orientation and health services. For families and communities, engagement strategies addressing parental concerns and sociocultural misconceptions may help reduce restrictions experienced by unmarried young women. At the broader public-health level, menstrual cup messaging should shift towards behaviour-change approaches that normalize reusable products, highlight safety and sustainability, and provide pathways for trial without financial burden. Targeting participants in this study also have downstream benefits, as increasing comfort and competence within this group can translate into future clinical advocacy and more informed menstrual health counselling.

Conclusion

This study demonstrates that there is awareness of menstrual cups, but minimal usage among participants, with hesitancy driven by fear, limited practical knowledge, and social constraints. Addressing these barriers requires confidence-building interventions and supportive institutional environments in addition to information. Improving acceptance in this group may enhance future clinical counselling and public-health messaging in India.

Declarations

Data Availability Statement

The datasets generated during and/or analysed during the current study are available from the corresponding author on reasonable request.

ETHICAL APPROVAL

Ethical approval was obtained from the Institutional Ethics Committee Vinayaka Mission's Medical College and Hospital, Karaikal, Puducherry, India via, approval number IEC/VMMCH/2024/APR/75

CONSENT

Informed consent was obtained from all participants prior to their inclusion in the study. Participation was voluntary, and responses were collected anonymously.

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This research received no external funding.

CLINICAL TRIAL REGISTRATION

Clinical trial number: Not applicable.

CONSENT TO PUBLISH

Consent to publish: We give our consent for publication.

CONFLICT OF INTEREST

The authors declare no conflict of interest.

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