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Original Research Article

Knowledge, attitude and experience of menstrual cup usage among medical students at a tertiary care teaching hospital in central Kerala: a cross-sectional study

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ABSTRACT

Background: Sanitary napkins contribute substantially to solid waste generation, and their disposal poses significant environmental challenges. Menstrual cups offer an eco-friendly and cost-effective alternative to disposable sanitary pads; however, their adoption remains limited among Indian women. The objectives of this study were to assess the knowledge, attitude and experience of the women medical students in a college in central Kerala, India regarding the use of menstrual cups.

Methods: The study was a prospective cross-sectional study carried out in 183 female medical students. It was done over a period of 6 months (from February 2025 to July 2025) in tertiary care centre of central Kerala. A self-administered online questionnaire was used to gather data, which was created with Google Forms. A questionnaire was used to evaluate the demographic, knowledge, attitude and experience of using the menstrual cup.

Results: The findings were that 97.8% of the respondents knew about menstrual cups while 8.2% of them used. The majority of the participants (64.5%) believed that the use of menstrual cups is a better alternative than sanitary pads and 86.3% were interested to receive formal training on the use of menstrual cups. Discomfort, fear of insertion, and lack of knowledge were the main obstacles to adoption. The main source of information was social media (51.9%). Even though the cups were not being used, 59% of the non-users said they would like to use them in the future.

Conclusions: The awareness rate of the menstrual cup was high amongst medical students, but the use of the menstrual cup was still low. Educational programs, organised demonstration activities, and specific awareness raising campaigns can help close the knowledge-action gap and encourage the use of sustainable menstrual hygiene products.

Keywords: Menstrual cup, Menstrual hygiene, Medical students, Sanitary napkins

INTRODUCTION

Menstrual hygiene is an integral part of women's health. The improper management of menstruation and poor-quality menstruation products can contribute to the occurrence of reproductive and urinary tract infections, which can have negative health effects.^{1,2} Menstrual hygiene products such as sanitary pads, cloths, tampons and menstrual cups are used to control menstrual flow.³

Sociocultural norms, economic considerations, availability and personal preferences all affect the choice of menstrual hygiene product. No single product is right for everyone during menstruation as each has its own pros and cons.

Sanitary napkins are the most popular menstrual hygiene products in India due to their ease of use, availability, and convenience.⁴ They are, however, also a significant source

of solid waste, as an estimated 113,000 tonnes of menstrual waste is generated annually.⁵ The Ministry of Drinking Water and Sanitation, Government of India estimates that around 12 billion sanitary pads are thrown away every year, which is a significant amount of solid waste.⁶ Furthermore, if not disposed properly, used sanitary pads that come in contact with menstrual blood can be a breeding ground for pathogenic microorganisms.⁶ The issues raised in this context highlight the critical importance of advocating for sustainable and environmentally friendly menstrual hygiene solutions. The Solid Waste Management Rules, 2016, state that used sanitary napkins must be wrapped in a pouch provided by the manufacturer and/or an appropriate wrapping material and placed in a dry or non-biodegradable waste collection container prior to being taken to an authorized waste processing facility.⁷ The successful implementation of these guidelines is dependent on public awareness, source separation of waste and the provision of suitable waste management facilities. However, the improper disposal of waste products, including open dumping, burning, burying and flushing sanitary napkins into toilets, continues to be prevalent, and it is a serious environmental and public health problem.^{8,9}

Some of the main challenges to their adoption include limited awareness, concerns about insertion and leakage, perceived discomfort, poor availability, cultural misconceptions, and lack of promotion.¹⁰⁻¹² Menstrual hygiene challenges are still seen in educated population including healthcare students who are expected to have higher knowledge about the menstrual hygiene products.

Thus, the present study was designed to assess the knowledge, attitude and experience of the women medical students in a college in central Kerala, India regarding the use of menstrual cups.

METHODS

This was a prospective cross-sectional study conducted at department of obstetrics and gynecology of Amrita Institute of Medical Sciences, Kochi, Kerala, India among female medical students during February 2025 to July 2025.

Inclusion criteria

The study included female medical students aged ≥ 17 years who were enrolled at the institute during the study period. Students who provided written informed consent and agreed to participate were included in the study.

Exclusion criteria

Male students, non-medical students, students from institutions other than Amrita Institute of Medical Sciences, Kochi, and staff members were excluded from the study.

Sample size

The sample size was determined by using the result of the previous study conducted by Arumadi et al which showed a prevalence of 58.7% for fear of insertion of foreign body and 34.8% for difficulty in using menstrual cups.¹³ The minimum sample size was calculated to be 180 participants at a 95% confidence level with an allowable error of 20%. Thus, 183 participants were selected for the present study.

Study tool and data collection

A structured, self-administered online questionnaire was developed after a thorough literature review and validated by a consultant gynaecologist to collect the data. The questionnaire had 21 questions that included knowledge, attitudes, and experiences of the participants regarding the menstrual cup (Annexure I). The survey was conducted electronically through Google forms and the survey link was sent to eligible participants by WhatsApp and institutional e-mail after obtaining written informed consent. It was a voluntary study and responses were kept confidential and anonymous throughout. Completed questionnaires were used in the final analysis, with a total of 183 completed questionnaires.

Ethical considerations

Institutional ethical approval was obtained before commencement of the study. Participation was entirely voluntary, and electronic informed consent was obtained from all participants before administration of the questionnaire. Confidentiality and anonymity of the participants were maintained throughout the study. All data were collected and analyzed in accordance with ethical principles for research involving human participants.

Statistical analysis

The collected data were entered into Microsoft Excel and analysed using descriptive statistics. The data was analysed by using epi info statistical software version 7. Continuous variables were expressed as mean and standard deviation, while categorical variables were summarized as frequencies and percentages.

RESULTS

Participant characteristics

A total of 183 female medical students participated in the study. The age of the participants varied from 17 to 32 years with an average 20.56 ± 2.12 years. The first-year students accounted for the highest percentage (32.2%), third year students (31.1%), second year students (18.6%), fifth year/internship students (13.1%), and fourth year students (4.9%) (Table 1).

Table 1: Demographic characteristics of the study participants (n=183).

Variables	Number of participants (n=183)	
Age (mean±SD)		
17 to 32 years	20.56±2.12	
Student study years	Frequency	Percentage
First year	59	32.2
Second year	34	18.6
Third year	57	31.1
Fourth year	9	4.9
5 th year/internship	24	13.1
Total	183	100

Table 2: Knowledge about menstrual cups (n=183).

Knowledge questionnaire	Frequency	Percentage
Have you received any kind of education on menstrual health in your medical curriculum?		
Yes	110	60.1
No	73	39.9
Have you heard of a menstrual cup before?		
Yes	179	97.8
No	4	2.2
What is the average lifespan of a menstrual cup?		
1-2 years	42	23.0
3-5 years	42	23.0
6-10 years	42	23.0
I don't know	52	28.4
More than 10 years	5	2.7
How often should a menstrual cup be emptied during menstruation?		
Every 2-4 hours	47	25.7
Every 6-12 hours	102	55.7
I don't know	30	16.4
Once a day	4	2.2
Do you think menstrual cups can cause any kind of infection if not used properly?		
Maybe	91	49.7
Yes	82	44.8
No	10	5.5
Do you believe menstrual cups are a better alternative to sanitary pads?		
Maybe	50	27.3
Yes	118	64.5
No	15	8.2
What are the benefits of using a menstrual cup?		
Environmental Benefits	116	63.4
Cost effective	106	57.9
Safer than pads or tampons	103	56.3
More comfortable	93	50.8
Reduce risk of infection	78	42.6
How did you first learn about menstrual cups?		
Advertisements	14	7.7
Friends or family	63	34.4
Medical education	10	5.5
Social media	95	51.9
All of the above	1	0.5
What do you think the way of cleaning menstrual cup?		
Plain water	5	5
Warm water	51	47
Boiling/cleaning with disinfectant	53	48.6

Knowledge about menstrual cups

Table 2 depicted knowledge about menstrual cups of the participants. In general, the participants had good knowledge about menstrual cups. Over half (60.1%) received menstrual health education in their medical education curriculum and nearly all (97.8%) were aware of what a menstrual cup was. When it came to the lifespan of their menstrual cups, 23.0% thought they could use it for 1-2 years, 3-5 years, or 6-10 years, and 28.4% had no idea, with only 2.7% saying they would use it for more than 10 years

When asked about the frequency of emptying the cup during menstruation, more than half of the participants (55.7%) correctly answered that it should be emptied every 6-12 hours while menstruating, 25.7% said it should be emptied every 2-4 hours, 16.4% did not know, and 2.2% emptied it once daily. Nearly half of the respondents (49.7%) thought that menstrual cups could lead to infection when not used properly, 44.8% agreed that it could lead to infection if not used properly and 5.5% disagreed.

The majority of participants (64.5%) thought that the menstrual cup was a better option than sanitary pads, 27.3% were not sure and 8.2% disagreed. Sustainability (63.4%), cost-effectiveness (57.9%), safety over pads/tampons (56.3%), comfort (50.8%) and decreased risk of infection (42.6%) were the most commonly cited advantages. Menstrual cups were mainly learned about from social media (51.9%), friends or family (34.4%), advertisements (7.7%) and medical education (5.5%). In

terms of cleaning, 48.6% said they should use boiling or disinfectant cleaning, 47.0% said they should use warm water, and 5.0% said they should use plain water. The results showed that awareness of the menstrual cup was high, but there were some gaps in knowledge, such as the lifespan and how to maintain and prevent infections with the menstrual cup.

Attitude towards menstrual cups

Table 3 depicted the general attitude of the participants was positive towards the use of menstrual cups even though the use was low. Almost half of the respondents (45.4%) said they would recommend menstrual cups to their friends and family; 43.2% were not sure and 11.5% would not recommend them.

A vast majority (86.3%) felt that medical students should be formally trained about menstrual cups and its usage, while 10.4% said maybe and 3.3% disagreed. As for future use, 65.0% were not sure whether they would continue using the menstrual cup or not, 24.6% were willing to use the cup in the future, and 10.4% did not plan to use the cup in the future.

Fear of discomfort (57.9%), lack of awareness (32.2%) and lack of medical guidance (9.8%) were the most common barriers perceived by the women. The results indicate that participants had positive attitudes towards menstrual cups, but their primary concerns were discomfort and lack of awareness, highlighting the need for greater awareness and more formal education to increase the acceptance of menstrual cups.

Table 3: Attitude towards menstrual cups (n=183).

Attitude questionnaire	Frequency	Percentage
Would you recommend menstrual cups to your friends and family members?		
Maybe	79	43.2
Yes	83	45.4
No	21	11.5
Do you think medical students should receive formal training on menstrual cups and their usage?		
Maybe	19	10.4
Yes	158	86.3
No	6	3.3
Would you continue using a menstrual cup in the future?		
Maybe	119	65.0
Yes	45	24.6
No	19	10.4
What do you think are the biggest barriers to menstrual cup adoption?		
Fear of discomfort	106	57.9
Lack of awareness	59	32.2
Lack of medical guidance	18	9.8

Table 4: Experience regarding menstrual cups (n=183).

Experience questionnaire	Frequency	Percentage
Have you ever used a menstrual cup?		
No, but I'm interested in trying	108	59.0
No, I have no interest in trying	54	29.5
Yes, but stopped using it	6	3.3
Yes, currently using	15	8.2
If you have used a menstrual cup, what was your primary reason for choosing it?		
Comfort and convenience	20	10.9
Cost effectiveness	4	2.2
Environmental benefits	14	7.7
Medical reasons (e.g.: allergic towards pads or tampons)	8	4.4
Not yet started	137	74.9
If you stopped using a menstrual cup, what was the main reason?		
Difficulty in insertion/removal	13	7.1
Discomfort	8	4.4
Hygiene concerns	1	0.5
Leakage issues	4	2.2
Not started using	148	80.9
Others	9	4.9
Would you encourage other students to try menstrual cups based on your experience?		
Maybe	119	65.0
Yes	46	25.1
No	18	9.8
How was your initial experience with menstrual cup usage?		
Difficult	9	4.9
Haven't used yet	156	85.2
Took some time to adjust but now comfortable	13	7.1
Very easy to use	5	2.7

Experience regarding menstrual cup usage

Table 4 depicted most participants had never used a menstrual cup, but were interested in using one (59.0%), with 29.5% not interested in using a menstrual cup. 8.2% were using it currently and 3.3% had stopped using it. Of those who used menstrual cups, the most common reason for using them was comfort and convenience (10.9%), followed by environmental (7.7%), medical (4.4%) and cost effectiveness (2.2%). Most participants (74.9%) had not yet started using a menstrual cup.

For those who had discontinued or tried menstrual cups, the most frequent reasons were difficulty in inserting or removing the cup (7.1%), discomfort (4.4%), leakage (2.2%), hygiene (0.5%), and other (4.9%). The majority (80.9%) had not started using menstrual cups.

When asked about recommendation, 65.0% of the participants said they would consider recommending menstrual cups to other students, 25.1% would recommend and 9.8% would not recommend. A majority of participants (85.2%) had never used a menstrual cup. Of those who use it, 7.1% said they needed some time to get used to it before getting comfortable, 4.9% said it was

difficult to use and only 2.7% said it was very easy to use. These results suggest that while the use of menstrual cups is currently low, there is a high level of interest in their use, with the main obstacles to their uptake being the practical issues experienced during the initial use.

DISCUSSION

A prospective cross-sectional study conducted among female medical students of medical college in central Kerala. This study assessed the knowledge, attitude and experience about menstrual cup uses. While awareness and positive attitudes were good, utilization was low, suggesting that knowledge does not necessarily lead to practice. The results show a number of important trends in future healthcare professionals' awareness and use of menstrual cups. In this study out of 183 students 97.8% are aware about the menstrual cup and proportion of participants using menstrual cup was found to be 8.2%. Nevertheless, menstruation awareness, although high, was found to have significant gaps in the knowledge of menstrual cup lifespan, cleaning of the menstrual cup and prevention of infection in the present study, similar to the study conducted by van Eijk et al.¹⁴ Arumadi et al study in North Kerala, also reported significant gaps in knowledge

about menstrual cup lifespan, cleaning and prevention of infection.¹³

Among 103 (56.3%) of the students, said menstrual cups to be a safe, which was same, when compared to a similar study, where 59% of the students, said it is safe to use menstrual cups.¹⁵ The most common reasons for choosing menstrual cups among users in the present study were comfort and convenience (10.9%) and environmental benefits (7.7%), which are consistent with previous studies reporting that users primarily appreciate menstrual cups because of their long-term cost savings, environmental sustainability, and comfort after overcoming the initial learning curve.^{14,16}

Friends and family (34.4%) were the second most common source of information, with social media leading the way (51.9%) and only a small number of respondents learning about menstrual cups from medical education (5.5%). In recent studies, digital platforms have emerged as the main source of information on menstruation for young women, corroborating the need to boost menstrual education in undergraduates' curriculum.¹⁶ The relative lack of contribution from formal medical education seen in the present study further underscores the need to enhance medical students' curriculum on menstrual health.

In a similar study conducted among medical students by Eti et al none of the participants were using the menstrual cup. Regarding the sterilization of menstrual cup, which is more important to prevent infections, around 45.96% were aware of the appropriate frequency of clearing the cup and only 28.4% chose boiling the cup as the measure for sterilizing it.¹¹ In this study in terms of cleaning, 48.6% said they should use boiling or disinfectant cleaning, 47.0% said they should use warm water, and 5.0% said they should use plain water. which shows that many women in the community too had idea regarding sterilization of the cup.

In the study of south Kerala, 56.2% participants responded fear of insertion as reason for not using menstrual cup.¹⁷ In the study of north Kerala, 58.7% participants had the fear of insertion about menstrual cup.¹³ Both findings of the study are comparable with present study (57.9%).

A study by Kaur et al found that most healthcare students recognized the advantages of menstrual cups and were willing to recommend them after receiving adequate information.¹⁸ Similarly, van Eijk et al reported that women who had knowledge or experience with menstrual cups generally expressed high satisfaction and were more likely to recommend them to others following successful adoption.¹⁴

In summary, the results of the present study are consistent with recent research, which shows that the awareness and attitudes of medical students towards the use of menstrual cups are positive, but practical use is limited due to lack of confidence, discomfort and insufficient guidance.

Demonstrations, peer support, and evidence-based counselling combined with structured educational programs can help create a knowledge-to-action gap and ultimately contribute to sustainable menstrual hygiene management among future health care workers.

In the present study, findings may not be generalizable because of the study being conducted in a single medical college. Responses may also be subject to reporting bias due to being self-reported questionnaire. Additionally, cultural and regional differences in menstrual hygiene practices were not explored. It is not possible to establish causality with the cross-sectional design.

CONCLUSION

The present study revealed that the awareness about menstrual cups among the female medical students was high, but their use was low. While there were a positive attitude and awareness about the environmental and economic advantages of the menstrual cup, there were some challenges that included the fear of insertion, perceived discomfort, and lack of practical knowledge. The results underscore the importance of targeted education, practical training, and incorporating menstrual cup education into the medical education curriculum to close the awareness-practice divide. Educating and providing practical advice on how to use the menstrual cup can help increase the acceptance and use of menstrual cups, which can contribute to sustainable menstrual hygiene practices among future health workers.

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Conflict of interest: None declared

Ethical approval: The study was approved by the Institutional Ethics Committee

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