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Original Research Article

IMPACT OF HEALTH EDUCATION ON ACCEPTANCE OF VAGINAL MENSTRUAL CUPS AMONG STUDENTS IN A TEACHING HOSPITAL, TIRUPATI

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ABSTRACT

Background: Menstrual cups offer a cost-effective, eco-friendly alternative to disposable sanitary products, yet low awareness and cultural stigma limit adoption in India. This study assessed the impact of health education on knowledge, attitudes, and acceptance of menstrual cups among female students.
Materials and Methods: A pre and post interventional study was conducted among 304 female students pursuing medical, nursing and lab technician courses at Sri Venkateswara Medical College, Tirupati. Data will be collected by a predesigned, pretested semi structured questionnaire comprising age, socio-economic status (SES) by BG Prasad classification, baseline and post-intervention knowledge, attitudes and acceptance of menstrual cups. Intervention by health education included 30 minutes awareness session addressing the use of menstrual cups, cultural barriers and demonstration of usage.
Results: Mean age was 21.2 years with a standard deviation of 1.5. Majority were medical students (59.9%), followed by paramedical group (25.0%) and medical lab technician group (15.1%). Overall mean knowledge scores improved from 7.0±0.7 to 8.6±0.6, while attitude scores rose substantially from 10.2±1.3 to 15.3±1.1. Most notably, the intervention led to a dramatic and significant ($p<0.001$) rise in the proportion of menstrual cup users, with the overall acceptance rate surging from 12.5% to 75.0%. Barriers included fear of leakage/sticking (46.2%), lack of knowledge (43.1%). Among those who have tried using menstrual cups, insertion difficulty is found in 41.2%.
Conclusion: The study underscores the importance of health education in encouraging the use of menstrual cups, noting significant improvements in understanding, perceptions, and willingness to use them.
Keywords: Menstrual cups, health education, knowledge, attitude, acceptance.

INTRODUCTION

Menstruation is a shared reality for women worldwide, yet in India, it remains a topic cloaked in silence, stigma, and unequal access to hygienic solutions. For over 350 million women in India, managing periods with dignity is often a struggle shaped by cultural norms, economic constraints, and limited awareness of modern options.[1] Menstrual cups, which are reusable silicone devices that collect menstrual flow, represent a transformative alternative. But their adoption in India lags with usage rates as low as 1-15% among college-aged women. Environmentally, cups are a sustainable choice; a single cup can replace thousands of pads or tampons. This could significantly reduce the 12.3 billion sanitary pads discarded annually in India, which clog landfills and waterways.[2]

Menstrual cups are small, flexible, bell-shaped devices, typically made of medical-grade silicone, inserted vaginally to collect menstrual blood. They can hold 10-38 ml of fluid, be worn for up to 12 hours, and are emptied, rinsed, and reused for up to 10 years with proper care. Their benefits are compelling. Health-wise, cups lower the risk of infections like bacterial vaginosis or toxic shock

syndrome compared to cloths or prolonged pad use, provided hygiene practices are followed.[3]

Economically, a single cup, priced at ₹300-1500, can save thousands compared to disposable pads, which cost ₹6000-12000 annually for regular users.[4] This is a game-changer for college students, who often rely on limited allowances or family support. For young women, cups offer practical advantages: fewer changes during busy college days, freedom to engage in sports or travel, and reduced anxiety about leaks.[5]

Despite these advantages, menstrual cups remain a niche choice in India, overshadowed by the dominance of disposable pads. Lack of awareness is a major critical barrier. Unlike sanitary pads, backed by aggressive marketing from multinational corporations, menstrual cups receive minimal promotion. They are rarely stocked in local pharmacies or supermarkets, and media campaigns are limited, leaving many women unaware of their existence. Even when cups are known, misconceptions—such as fears of pain, leakage, infertility, or damage to the hymen—deter trial. These fears stem from a lack of practical guidance on insertion, removal, and maintenance, which requires a learning curve that can feel intimidating without support.[4,5]

Cultural barriers are a major obstacle. This cultural resistance is compounded by generational gaps; mothers and elders, who influence young women's choices, often lack knowledge about cups and may discourage their use.[6] The act of inserting a cup challenge deeply held beliefs about virginity, bodily purity, and modesty, particularly in conservative communities, where such actions may be seen as inappropriate or shameful.[7]

The barriers to menstrual cup adoption like cultural stigma, lack of awareness, misconceptions, and practical challenges are deeply intertwined but not insurmountable. In India, where menstrual hygiene is gaining policy attention through initiatives like the National Menstrual Hygiene Scheme, promoting sustainable options like cups aligns with goals to improve women's health and environmental outcomes. Additionally, the lack of endorsement from trusted sources, such as gynaecologists or community health workers, undermines confidence in cups` safety and efficacy. In India, where medical advice carries significant weight, this gap in professional advocacy is a notable barrier.[8]

This study examines the impact of health education on the knowledge, attitude and acceptance of menstrual cups and identify barriers encountered during the usage of menstrual cups among college-going girls at a medical college in urban Tirupati.

MATERIALS AND METHODS

A quasi-interventional study (one-group pre-test post-test design) was conducted over a period of four months at Sri Venkateswara Medical College, Tirupati. The study was approved by the Institutional Scientific and Ethical Committees. The study participants were female students enrolled in various courses at the college.

The sample size was calculated using the formula for estimating a single proportion: $n = Z\alpha/2^2 \times p \times (1 - p)) / d^2$, where $Z\alpha/2 = 1.96$ (95% confidence level), p is proportion of good knowledge based on a previous study9, which was 0.737, and d is absolute precision of 0.05. The calculated minimum sample size was 304 participants.

A stratified random sampling technique was employed to ensure proportional representation. The student population was stratified into three groups: medical (MBBS), paramedical (Nursing), and diploma students (Medical Lab Technology). This means the size of the sample from each stratum (e.g., 150 Medical, 90 Nursing, 64 MLT) reflects the actual size of those groups in the total population. Within each stratum, participants were selected using a simple random sampling method from official student lists. Female students who had attained menarche and were willing to provide written informed consent were included in the study. Participants with any medical contraindication for menstrual cup usage, such as vaginal anomalies, uterine prolapse, active genital infections, or a history of toxic shock syndrome, were excluded.

Data were collected using a pre-tested and validated semi-structured questionnaire pertaining to socio-demographic details (age, educational stream, socioeconomic status classified by the BG Prasad scale), Knowledge assessed by ten questions, with a total score ranging from 0 to 10. Attitude assessed using a 5-point Likert scale (0-strongly disagree to 4-strongly agree) for five statements, yielding a total score ranging from 0 to 20. Acceptance, defined as the willingness to use a menstrual cup. Following the pre-test, a structured health education session was administered to all participants. The session focused on the advantages of menstrual cups and demonstrated the correct method of their insertion, removal, and maintenance. After one month, the same questionnaire was re-administered to all participants to assess changes in knowledge, attitude, and acceptance.

Data Analysis: Data were entered into Microsoft Excel 2010 and analyzed using Epi Info version 7.2.1 (CDC, Atlanta, USA). Descriptive statistics were presented as means with standard deviations (SD) for quantitative data and frequencies with percentages for categorical data. The paired t-test was used to compare the mean knowledge and attitude scores before and after the intervention. The McNemar test was used to compare the proportion of menstrual cup acceptance pre- and post-intervention. A p-value of <0.05 was considered statistically significant.

RESULTS

Table 1: Socio demographic variables of study participants

Variable	Category	Frequency	Percentage
Age group in years	21-22	231	76.0
	23-24	73	24.0
Educational stream	Medical student	182	59.9
	Nursing student	76	25.0
	Medical lab technician student	46	15.1
Socioeconomic status (BG Prasad)	Class I	73	24.0
	Class II	82	27.0
	Class III	76	25.0
	Class IV	73	24.0

Participants were predominantly composed of medical students (59.9%), followed by paramedical (25.0%) and medical laboratory technology (MLT) students (15.1%). Socio-economic distribution as per the BG Prasad classification showed that the majority of participants belonged to Class II (27.0%) and Class III (25.0%). Age of the participants included 21- 24 years with mean age of 21.9 years and standard deviation of 0.9 years [Table:1].

Table 2: Comparison of Knowledge on menstrual cups before and after health education (Paired t-test)

Variable	Category	Pre test (mean±SD)	Post test (mean±SD)	P value
Age group in years	21-22 (n=231)	6.7±0.4	8.3±0.41	**<0.001***
	23-24 (n=73)	8.0±0.2	9.5±0.2	**<0.001***
Educational stream	Medical student	7.0±0.6	8.6±0.6	**<0.001***
	Nursing student	7.0±0.7	8.6±0.6	**<0.001***
	Medical lab technician student	7.0±0.7	8.6±0.6	**<0.001***
Socioeconomic status (BG Prasad)	Class I (n=73)	6.2±0.4	7.9±0.3	**<0.001***
	Class II (n=82)	7.1±0.1	8.7±0.1	**<0.001***
	Class III (n=76)	6.6±0.1	8.2±0.1	**<0.001***
	Class IV (n=73)	8.0±0.2	9.5±0.2	**<0.001***
Total (n=304)		7.0±0.7	8.6±0.6	**<0.001***

Statistically significant

A statistically significant ($p<0.001$) increase in knowledge scores was observed following the health education session. Regardless of age, educational stream, or socioeconomic status, every category showed a substantial improvement from pre-test to post-test [Table 2].

Table 3: Comparison of Attitude regarding menstrual cup usage before and after health education (Paired t-test)

Variable	Category	Pre test (mean±SD)	Post test (mean±SD)	P value
Age group in years	21-22 (n=231)	9.5±0.7	14.8±0.7	**<0.001***
	23-24 (n=73)	12.2±0.6	17.0±0.4	**<0.001***
Educational stream	Medical student (n=150)	10.2±0.3	15.3±1.3	**<0.001***
	Nursing student (n=90)	10.1±1.3	14.8±2.1	**<0.001***
	Medical lab technician student (n=64)	9.4±1.4	13.5±3.2	**<0.001***
Socioeconomic status (BG Prasad)	Class I (n=73)	9.3±0.7	14.5±0.7	**<0.001***
	Class II (n=82)	10.3±0.2	15.5±0.2	**<0.001***
	Class III (n=76)	8.9±0.2	14.3±0.1	**<0.001***
	Class IV (n=73)	12.2±0.6	17.0±0.4	**<0.001***
Total (n=304)		10.2±1.3	15.3±1.1	**<0.001***

Statistically significant

The health education intervention resulted in a highly significant ($p<0.001$) and substantial improvement in attitudes regarding menstrual cup usage across all demographic categories, including age, educational stream, and socioeconomic status, conclusively indicating that the session was universally successful in fostering a more positive attitude toward menstrual cup use among all participants [Table 3].

Table 4: Comparison of proportion of menstrual cup users before and after health education

Variable	Category	Pre test n(%)	Post test n(%)	P value
Age group in years	21-22 (n=231)	3(1.3)	164(70.9)	**<0.001***
	23-24 (n=73)	35(47.9)	64(87.7)	**<0.001***
Educational stream	Medical student (n=150)	17(11.3)	108(72.0)	**<0.001***
	Nursing student (n=90)	10(11.1)	71(78.8)	**<0.001***
	Medical lab technician student (n=64)	11(17.1)	49(76.5)	**<0.001***
Socioeconomic status (BG Prasad)	Class I (n=73)	3(4.2)	33(45.3)	**<0.001***
	Class II (n=82)	0(0.0)	69(84.1)	**<0.001***

	Class III (n=76)	0(0.0)	62 (81.6)	**<0.001***
	Class IV (n=73)	35(47.9)	64(87.7)	**<0.001***
Total		38(12.5)	228(75.0)	**<0.001***

Mc Nemer test, *Statistically significant

The health education intervention led to a highly significant (p<0.001) and dramatic increase in the acceptance of menstrual cups across all demographic groups. Overall acceptance surged from 12.5% to 75.0%, with particularly remarkable increases observed in the younger age group (21-22 years), which rose from 1.3% to 70.9%, and in lower socioeconomic classes, which achieved above 80% acceptance after the session. [Table 4]

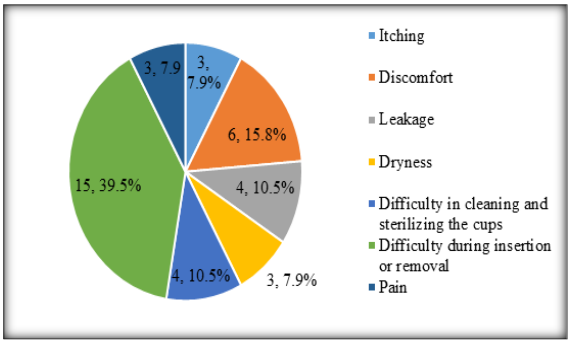

Figure 1: Primary problems reported by participants during initial use of menstrual cups (n=38)

Based on the reported data before health education, the predominant challenge associated with menstrual cup use was difficulty during insertion or removal, affecting (39.5%), followed by general discomfort (15.8%) and leakage (10.5%) [Figure 1].

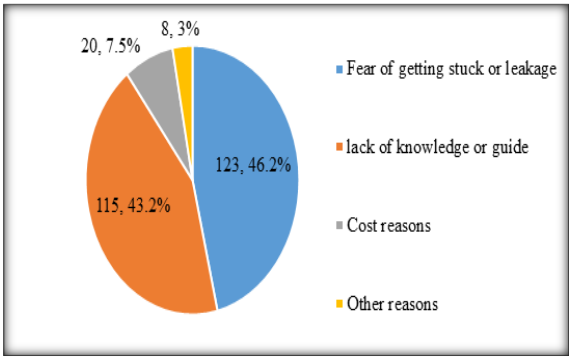

Figure 2: Key barriers to menstrual cup acceptance reported by non-users at baseline (n=266)

The predominant barrier for not using the menstrual cups is the fear of the cup getting stuck or leaking (46.2%), closely followed by a lack of knowledge or guidance on how to use it (43.2%). Cost was a secondary concern for only a small minority (7.5%). Other reasons (3.0%) include cultural beliefs, taboos, or personal preferences [Figure 2].

DISCUSSION

The mean (±SD) age of the participants in the present study was 21.9 (±0.9) years, ranging from 21 to 24 years. This is similar to findings reported in a study from Puducherry.[10] Before intervention the proportion of menstrual cup users were 12.5% in this study. Where as in other studies, it was as low as 2.6%11to 15.6%.[12]

At baseline, nearly one-fifth of the participants (20%) had adequate knowledge (score >8) regarding menstrual cups. Similar findings were reported in some studies.[11,13] While none had knowledge in a study done in North India.[14] In another study at Kerala among college female students 32.2% were aware of menstrual cups.[15]

The current study demonstrated significant improvement (P<0.001) in the knowledge component regarding menstrual cup usage after providing health education, from 7.0±0.7 (mean±SD) to 8.6±0.6 (mean±SD). In a study conducted by James et al,16 positive change in awareness was documented where menstrual cups were preferred as a result of health education interventions among younger generations. Varghese et al reported an increase of knowledge to 90% after health education.[17]

Post health education, significant improvement (P<0.001) was also observed in attitude component from 10.2±1.3 (mean±SD) to 15.3±1.1 (mean±SD). In other studies, conducted by Varghese et al,[17] and Arumadi et al18, there was significant increase in the proportion of attitudes among the subjects. The health education session was unequivocally effective in creating a more favorable attitude toward menstrual cups.

Acceptance rate was increased from 12.5% to 75.0% (P<0.001) after health education. Similar improvement was observed in Varghese et al. study,[17] and Abraham et al study,[19] with 40% and 35% subjects using menstrual cups post-intervention. This suggests that our specific health education intervention may be particularly effective, potentially offering a model for similar educational settings. Menstrual cup usage was found to be higher in a study conducted at Kerala,[20] possibly due to increased awareness within the healthcare setting, alongside factors such as age, marital status, sterilization history, peer support, and the growing influence of social media.

Regarding barriers affecting the use of menstrual cups, among the 266 subjects not using menstrual cups during baseline data collection, fear of leakage/sticking (46.2%) and lack of knowledge (43.2%) was reported. Similarly, Abraham et al study,[19] reported 37% stigma and 45% faced difficulty and fear during insertion when trying to use menstrual cups. The results of the study underscore the efficacy of targeted interventions in overcoming barriers to menstrual cup adoption in an Indian medical college setting.

CONCLUSION

This study highlights the pivotal role of health education in promoting menstrual cups, demonstrating significant gains in knowledge, attitudes, and acceptance among participants. By leveraging students' knowledge and addressing stigma and sanitation barriers, we can advance sustainable menstrual hygiene practices, contributing to India's public health goals.

Limitations: The study's single-site focus on urban medical students limits generalizability. The learning curve for adopting menstrual cups is long, often taking around 3 to 6 months. Hence, long-term follow-up studies could correctly capture its acceptance among students.

Recommendations: Future sessions should include more detailed, practical troubleshooting guides and visual aids (e.g., anatomical models, detailed videos) to build confidence and overcome barriers. Peer-to-peer education can be a powerful tool to overcome hesitation and provide ongoing support. Conduct studies with longer follow-up periods (6 months, 1 year) to assess the sustainability of menstrual cup use, long-term satisfaction, and any emerging challenges. Conduct in-depth interviews or focus group discussions to gain a richer understanding of the cultural, personal, and logistical barriers that are not fully captured by a structured questionnaire.

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