

## RESEARCH ARTICLE

# Sustainable menstruation and menstrual cups: Study on awareness and intention to use in the state of Kerala

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### ABSTRACT

Sustainable menstruation promotes health, social well-being, and minimizes negative environmental impacts. As opposed to single-use tampons and pads, which absorb blood, the menstrual cup collects menstrual blood and can last for up to ten years. The present study attempted to understand the awareness level about sustainable menstruation and menstrual cups, intention to use menstrual cup, and factors inhibiting as well as facilitating the use of menstrual cups among young women. Data was collected through a survey of 1937 menstruating college students in Kerala. The study indicated a high level of awareness about cloth pads and menstrual cups among college students. Though the use of menstrual cups was found to be low, the intention to use menstrual cups was reported to be above average. The major factor for not using menstrual cups was related to fear of vaginal insertion and the major facilitating factor was found to be convenience. The study results will provide insights into designing focused awareness sessions to mitigate the reasons for not using menstrual cups.

**Keywords:** sustainable menstruation; menstrual cup; intention to use; awareness

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## 1. Introduction

Sustainable menstruation refers to the practice of using menstrual health products that benefit the user's health, social and economic well-being, and minimize negative environmental impacts. The common mechanisms used by women to collect menstrual blood include cloth, sanitary pads, tampons, and menstrual cups. The type of menstrual absorbent used is of utmost importance as a hygienic absorbent for the effective, safe, and comfortable menstruation management for young girls and women of reproductive age. However, fear, ignorance, cost, availability, prejudices, and cultural biases prevent menstruating women from experimenting with all available mechanisms. The most commonly used and easily available menstrual absorbent is sanitary pads, however, sanitary pads do not decompose completely, leaving behind two grams of non-biodegradable plastic. Moreover, it was also found that the use of pads can result in fungal infection, skin irritations, and allergies<sup>[1]</sup>.

Among the various menstrual absorbents available, menstrual cups have received least attention, as it involves insertion into the vagina and the associated cultural prejudices like losing virginity<sup>[2,3]</sup>. When menstruating, menstrual cups are placed in the vagina as a menstrual health product. Typically, it is made of

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silicone and can last for a decade or more <sup>[4]</sup>. The menstrual cup is a bell shaped device made of medical grade silicone which can be inserted into the vagina during menstruation periods to collect menstrual fluid <sup>[5]</sup>. They are reusable and can last upto ten years thereby reducing environmental pollution and cost associated with sanitary pads.

Though menstruation is a universal and natural phenomenon, women still find it difficult to talk about menstruation and related problems in an open forum. This is more commonly observed in developing countries. In several cultures, menstruation is still a taboo topic of taboo and often menstruating women are considered to be impure, dirty, and contaminated. In the Indian context, menstruation is often associated with shame, and a ‘culture of silence’ <sup>[6]</sup>, and hence very little research has happened to understand the menstrual challenges and hygiene-related issues. The shame encompassing menstruation has isolated women from the mainstream of society during their menstrual cycle in several ways. The most common example of this is girls in developing countries miss out on school days on account of menstruation due to embarrassment associated with menstrual leaks, water shortages, privacy problems, and inadequate sanitary disposal in sanitary facilities <sup>[6-9]</sup>. Menstrual health plays a vital role in women's health, confidence, and self-esteem and contributes to gender equality.

Two integral aspects of sustainable developmental goals (SDG) are gender equality and women's empowerment and studies have indicated that menstrual health management and sustainable menstruation practices can play a major role in achieving these goals <sup>[10]</sup>. Millions of adolescent girls in Indian villages are receiving sanitary pads through the Freedays scheme, which was approved in 2011 by the Ministry of Health and Family Welfare, Government of India. However this led to another issue as the pads had no mechanism to be collected or disposed of. Under the Nirmal Bharat Abhiyan, the government has been promoting mini-incinerators in educational institutions to solve this problem. This created a problem since many of these machines were not capable of maintaining 800C heat for long enough to completely destroy the pads. In addition to emitting dioxins, they released other toxic gases into the air. It was also discovered that the ash particles polluted soil and waters. Thus the govt. initiative to promote menstrual health among school girls inadvertently resulted in adding to environmental issues <sup>[11]</sup>. This again points to the need for a sustainable solution to maintain menstrual health. During the 2018 floods in Kerala, thousands of women stayed across 47 relief camps in the municipality of Alappuzha, and during that time disposal of sanitary pads posed a huge challenge for them. They either had to incinerate these sanitary pads or add to the existing piles of non-biodegradable plastic waste. Inspired by this challenge the authorities have come up with “Project Thinkal” as an alternative solution <sup>[12]</sup>. On 15 June 2019, a civic body in India, Alappuzha municipality in the state of Kerala launched “Project Thinkal” for free distribution of menstrual cups to women. As part of ‘Project Thinkal’ a team of medical professionals and experienced users of menstrual cups conducted awareness sessions focusing on holistic perspective of menstruation, involved body parts and their roles and location, hygienic maintenance, introduction to M-Cup history, material, usage – insertion and removal, when to use and when not, impact of age, sexual activity and past medical history on users, maintenance, storage, and replacement. Those who are comfortable using a menstrual cup probably prefer this product because it requires the least amount of water and space to be cleaned. Unlike sanitary pads, they won't pollute an already vulnerable environment. In another interesting project from Kerala, Muhamma Grama panchayat of Alappuzha district was announced as the first synthetic pad-free village in Kerala in 2020. As part of the project, the panchayat distributed cloth pads and menstrual cups to women at a nominal fee and conducted awareness programs<sup>[13]</sup>. Even in the 2023 Kerala state budget, an amount of Rupees ten crores has been announced for the promotion of menstrual cups<sup>[14]</sup>.

Several programs and initiatives have been floated by the government and local bodies at various levels to promote the use of menstrual cups <sup>[15]</sup>. However, despite the sustainable nature of the menstrual cup, its

acceptance rate is found to be low mainly due to the reason that menstrual cups are inserted and removed from the vagina, causing contact with genital tissues and menstrual fluids<sup>[3,16]</sup>. Therefore, the present study aims at understanding how young women in Kerala perceive sustainable menstruation and menstrual cups. Thus, the objectives of the study are as below:

- 1) to understand the awareness about sustainable menstruation and menstrual cups
- 2) to explore the intention to use a menstrual cup
- 3) to identify the major reasons for reluctance to use menstrual cup
- 4) to identify the major reasons for adopting menstrual cup

## **2. Methodology**

This study targets college girls as the target population because female university students are still trying out different menstrual products and peer norms and attitudes about menstrual health are more likely to influence the way they exchange information. The study followed an exploratory research design. A survey was conducted among college-going women in the reproductive age in the state of Kerala from December 2022 to May 2023. All the respondents were given an awareness session on sustainable menstruation and menstrual cups. Prior to the session they were asked to indicate their level of awareness about sustainable menstruation and various menstrual absorbents in part 1 of the questionnaire circulated to them in hard copy. “As part of our study, we conducted an awareness session of 45-60 minutes. In the first 45 minutes, the session focused on specific topics like the menstruation process, sustainable menstruation, introduction of various menstrual absorbents with their pros and cons, insertion and removal of menstrual cup, identifying the right size of menstrual cup and hygienic maintenance of menstrual cup. The session was followed by a question and answer session of 15 minutes where the participants shared their experiences, benefits and challenges of using menstrual cups and their related queries were addressed.

After the session, they were asked to fill out the part 2 of the questionnaire which had questions to measure the variable intention to use, the pattern of use of various menstrual absorbents, open ended questions and demographic details. A single question evaluated the intention to use a menstrual cup: “How likely are you to use a menstrual cup during your next period?” which was adapted from Huang and Huang conducted in 2020<sup>[17]</sup>. This was measured on a five-point likert scale ranging from 1 to 5 where 1 means highly unlikely and 5 means highly likely. The socio-economic status of the respondents was measured through annual family income in Indian National Rupees (INR) which fell into categories like 0.1-0.3 million (65.6%) 0.3-0.5 million (27.4%), 0.5-1million (4%) and above 1 million (3%). A large number of countries in Northern Africa, Southern Asia, South-eastern Asia and Western Asia do not collect data on reproduction and sexual activity for never-married women in demographic surveys and hence we did not collect information on sexual activity from our respondents<sup>[18]</sup>. Marital status was included, as a proxy for sexual activity by other researchers<sup>[19]</sup> and we followed the same approach in our study as well

Two, open-ended questions were also included in the survey, one to understand the major reason for non-preference of menstrual cups among non-users (objective 3) and another to understand the major reason for adopting menstrual cups among users (objective 4). It was a completely voluntary study, and respondents were assured their responses would be kept confidential. All the respondents were adults and informed consent was obtained from all of them. The ethical approval of the present study was gained from the Department Ethics Committee of the School of Management Studies, Cochin University of Science and Technology. A final analysis was performed based on the received sample of 1937 responses from 23 colleges across Kerala. Descriptive and frequency analysis of the data and hypothesis testing was carried out using SPSS 21. The

hypotheses were tested using one-way ANOVA at 0.05 level of significance. The open-ended questions were analyzed using summative content analysis.

### 3. Results

#### 3.1. Socio-demographic profile of the respondents

The average age of the respondents was 19.8 years with a standard deviation of 0.04. The respondents were in the age group of 18-24 years. The sample consisted of both undergraduate (1317) and postgraduate students (620). Among the sample, only 58 students were married and the remaining (1879) were all single.

**Table 1.** Socio-demographic profile of respondents.

Variable		Frequency (n)	Percentage (%)
Educational Qualification	UG	1317	70
	PG	620	30
Marital status	Single	1879	97
	Married	58	3
Socio-economic status	0.1-0.3 M*	1271	65.6
	0.3-0.5 M*	529	27.4
	0.5-1 M*	77	4
	Above 1 M*	60	3

**Note:** \*M=Million

The majority of the respondents were undergraduate students (70%) with some post-graduates (30%) as well. Similarly, a large proportion of our respondents were found to be single (97%) with a few married respondents (3%). Socio-economic status of the respondents revealed that majority of the respondents were in 1-3 lakhs (65.6%) category followed by 3-5 lakhs (27.4%), 5-10 lakhs (4%) and above 10 lakhs (3%) respectively.

The first objective of the study was to understand the awareness and usage of sustainable menstruation and menstrual cups. **Table 2** has summarized the awareness and usage percentage of various menstrual absorbents by the respondents. All the respondents were aware of sanitary pads and cotton cloth/pads. Regarding the menstrual cups, the respondents were found to have a relatively high awareness with an 85% awareness level. However, only very few respondents were aware of tampons (12%) and menstrual underwear (2%). The respondents were asked to report the most commonly used menstrual absorbent by them. A vast majority of the respondents reported to be using single-use sanitary pads (61.33%), followed by cotton cloth/pads (30.77%), menstrual cups (7.65%), tampons (0.2%), and menstrual underwear (0.05%). When we considered sustainable menstrual absorbents, we found that 38.46% of the respondents were using sustainable menstrual absorbents, but mostly cotton cloth/pads. It is also interesting to note that even though there was a high level of familiarity with menstrual cups among respondents (85%), only 7.65% of them were actually using them. Among the 58 married respondents only 5 of them were using menstrual cup. With respect to the socio-economic status it was found that menstrual cup usage was distributed as 6% (0.1-0.3 million), 8.5 % (0.3-0.5 million), 14.3% (0.5-1 million) and 1% (above 1 million) in the various socio-economic status categories.

**Table 2.** Awareness and use of menstrual absorbents.

Type of product	Awareness (%)	Usage (n)	Usage (%)
Sanitary pad	100	1188	61.33
Cotton cloth/cloth pads	100	596	30.77
Menstrual cup	85	148	7.65
Tampons	12	4	0.2
Menstrual underwear	2	1	0.05

To further check the statistical difference in the intention to use menstrual cups among the demographic variables of marital status (as proxy for sexual activity) and socio-economic status, the following hypotheses were tested:

**H1:** The intention to use menstrual cup differs between single and married women

**H2:** The intention to use menstrual cup differs across the various socio-economic status categories

One way anova was carried out to test both H1 and H2. The results indicated that there is a significant difference ( $F=16.55$ ,  $p=0.00$ ) between single (Mean=3.31) and married (Mean=3.86) respondents in their intention to use menstrual cup and thus H1 was accepted. The sample size of married women ( $n=58$ ) in our sample was very less in comparison to single women ( $n=1879$ ) and hence the results are limited in its generalizability. However, no significant difference was observed among the various socio-economic status categories ( $F= 0.8$ ,  $P=0.425$ ) of the respondents in their intention to use the menstrual cup. Thus, H2 was not accepted.

Second, the study sought to understand college students' intentions regarding using menstrual cups. The mean value for intention to use a menstrual cup was found to be 3.31 with a SD of 1.03. We can take this finding as a positive indicator that young women indicated an average intention to use menstrual cups.

Our third objective was to explore and understand the factors hindering the use of menstrual cups among students despite their high awareness of the cups. The sample size for this question was 1700, excluding the students who were using menstrual cups regularly or occasionally. The respondents were presented with an open-ended question and their responses could be classified into four major reasons namely: difficulty in inserting the cup the vagina (56%), fear of menstrual cup getting stuck in the vagina (21%), fear of leakage (5%), fear of infection (3%) and others/have not heard of menstrual cup (15%).

The fourth objective of the study was to understand the major factors that influence the adoption of menstrual cups. The respondents for this objective consist of 148 young women and their responses could be classified into three major categories, namely convenience (45 %), health reasons (25%), sustainability/concern for the environment (24%), and low-cost (6%).

### 3.2. Discussion and conclusion

This study was aimed at understanding the awareness level and usage of of young women in Kerala about menstrual cups and other sustainable menstrual absorbents among young women in Kerala. The study indicated a high level of awareness about cloth pads and menstrual cups among college students. However, it was also observed that despite the high level of awareness about sustainable menstrual absorbents, a majority of the respondents are still using single-use sanitary pads during their menstrual cycles. This was not surprising as

according to data from India's fourth and fifth National Family Health Surveys, most young women (15–24 years old) are using disposable sanitary napkins more frequently to protect themselves during their periods<sup>[20]</sup>. Thus, we need to infer that mere awareness alone will not result in the use of menstrual cups and need to understand the major reasons inhibiting the use of menstrual cups. A study done among students in South Africa showed that there was wide acceptance of menstrual cups among the students when they were given proper demonstration and training was given on the usage of cups<sup>[21]</sup>. The significance of training specifically in the Indian context was also highlighted by another study<sup>[12]</sup>. Similar steps in India will also will increase the probability of the use of menstrual cups.

It is also interesting to note that the respondents indicated only an average intention to use the menstrual cup in the future. Considering the sensitive nature of Indian culture related to sexual activity of unmarried women, we have considered marital status as the proxy for sexual activity among our respondents. Our findings pointed that married women showed high intention to use menstrual cups in comparison to single women. A major reason for this could be the myth related to losing of virginity as the use of menstrual cup involves insertion into the vagina. It should also be highlighted the major reason cited by young women for not using the menstrual cup was the fear of insertion. Concerns about losing virginity while using menstrual cups were expressed by immediate relatives of adolescent girls<sup>[23]</sup> and by the users as well<sup>[24]</sup>.

Menstrual cups, cloth pads, and period underwear represent only a small segment of the market despite their growing popularity<sup>[23]</sup>. The major reasons preventing young women from using menstrual cups were found to be stemming from the fear of insertion of menstrual cups into the vagina and the fear of the menstrual cup getting stuck inside the vagina. Though the users of menstrual cups consider personal reasons like convenience and health reasons as the motivating factors for the use of menstrual cups, it is also promising to note that 24% of our respondents have considered sustainability as well. Thus, our findings are similar to a study conducted among women in Rajasthan, India which also reported factors like comfort, convenience and low-cost as the major reasons for preferring menstrual cups<sup>[20]</sup>. Studies have repeatedly emphasized the role of awareness for the usage of menstrual cups<sup>[12]</sup>.

Studies have reported that while not widely known, menstrual cups can provide a safe and acceptable option for menstrual health, regardless of income level<sup>[3]</sup>. Menstrual cups have been recognized to have the potential to be an alternative menstrual health management product<sup>[25]</sup> and were also reported as a safe, comfortable, and sustainable alternative product with significantly fewer health concerns<sup>[12]</sup>. It was also found that compared with sanitary pads, menstrual cups have less leakage, they won't fall, and they're more comfortable once inserted<sup>[26]</sup>. Additionally, it was also found that the use of a menstrual cup not only changes how women physically experience their periods but also how they perceive menstruation and their bodies<sup>[24,26]</sup>. Menstrual cups are a practical, economical, and environmentally friendly way for schoolgirls to manage menstrual health<sup>[22,27]</sup>. A study in conducted in Turkey has found that women who used menstrual cups were more aware of how their products affect the environment.<sup>[28]</sup>

There are several challenges associated with menstrual cups, including easy accessibility, the availability of cups in appropriate size, and support systems for guidance and awareness<sup>[29]</sup>. Some other challenges include high chances of infection on using it in the public, leaking, and the cup getting stuck in the vaginal canal<sup>[12]</sup>. According to research, self-objectification and body shame are also associated with poor attitudes towards reusable menstrual products and low usage rates of them<sup>[29]</sup>. The need to increasing awareness campaigns and improving availability of cups are also identified as the major means by which such barriers can be overcome<sup>[10,30]</sup>. Hence, based on our research findings, we could conclude that further awareness programs should focus on eliminating the fear related to inserting the cup in the vagina and the cup getting stuck inside the vagina and should also highlight the comfortability and low-cost aspects.

Policymakers should take necessary steps to provide focused comprehensive awareness sessions on how to use menstrual cups and ensure that the intention to use is getting converted to actual behaviour. In conclusion, to promote the usage of menstrual cups among young women in Kerala, future awareness programs should focus on addressing concerns related to the insertion of menstrual cups and the myth of virginity loss, highlight the benefits, emphasizing the comfort, convenience, sustainability, and cost-effectiveness of menstrual cups and providing training offering practical demonstrations and training sessions to ensure proper usage and increase confidence among potential users.

The study has several limitations as well. The study's sample was limited to college students in Kerala in the age group of 18-24 which limits the generalizability of the study. Further, studies should explore the experiences of reproductive women in various age groups. The study used a cross-sectional design and longitudinal studies are better suited to understand changes in awareness and usage patterns over time and the long-term impacts of educational interventions. More in-depth qualitative studies will help to gain deeper insights to understand the influence of social and cultural factors. The study has not considered factors like availability, affordability and the influence of family and peers on the choice of menstrual absorbents and future should consider these contextual factors as well.

## **Conflict of interest**

No conflict of interest was reported by all authors.

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