

# Is menstrual cup a sustainable and safe alternative in menstrual hygiene management? A qualitative exploratory study based on user's experience in India

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## ABSTRACT

**Introduction:** Menstrual cup (MC) is the least popular alternative for Menstrual Hygiene Management (MHM) among the reproductive age group women in India. While studies across the globe have shown its usefulness over the conventional sanitary pads, there is a dearth of studies on use and satisfaction status among the MC users from Low- and Middle-Income Countries. Our study intends to explore the experiences and challenges encountered by the MC users.

**Method:** A qualitative exploratory study among 26 MC users was carried out telephonically using an In-Depth Interview Guide (IDI). The interviews were audio-recorded followed by transcription and translation. Data were analysed using thematic analysis method. MAXQDA (VERBI Software, Berlin, Germany) software was used for analysis.

**Result:** The age of participants ranged 25–37 years with a mean age of 29.6 ( $\pm 0.91$ ) years and their average duration of MC use was 2.4 ( $\pm 0.34$ ) years. MCs were found to be more economical, safe, convenient, and environment friendly compared to sanitary pads. The motivation to use MC was ingrained with the detrimental experiences of using sanitary pad. However, MC users had concerns about the lack of easy accessibility to cups, availability of appropriate size cup and support system for guidance and awareness.

**Conclusion:** MC is an effective and convenient period product that has potential to be an alternate method for MHM. However, it needs more awareness, promotion for wider use leveraging existing platforms. Future research is recommended to study the socio-cultural aspect about the acceptability of MC in rural India.

## 1. Introduction

Across the globe, women and girls have their own menstruation management practices, based on personal preferences, available resources, economic status, indigenous customs, cultural beliefs, and knowledge or education.<sup>1</sup> In Low- and Middle-income countries (LMICs), many adolescent girls witness physical discomfort and psychological distress due to lack of effective and affordable menstruation management products.<sup>2–6</sup> Access to appropriate, affordable hygiene menstrual products and their utilization are important to manage menstrual hygiene.<sup>7</sup> Sanitary pads, tampons, and menstrual cups (MC) have been introduced and promoted to achieve better menstrual

hygiene. Among them, disposable sanitary pads are the most widespread and popular among women and girls.<sup>8</sup> However, they aren't always the best option because of the associated problems such as leakage, disposal problems,<sup>9,10</sup> along with recurrent monthly expenses.<sup>2</sup>

While several nations, notably South Africa, Kenya, and India, provide free or subsidised sanitary pads to girls and women, as part of their Menstrual Hygiene Management (MHM) policies,<sup>2</sup> role of MC as an alternative needs to be studied. The first commercially used MC was invented and patented in the United States way back in the 1930 and recently in 2021, the first novel MC was designed and launched in India.<sup>11</sup> MC is a bell-shaped device made up of high-grade medical silicone. It is put inside the vagina during the period. It collects about

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10–38 ml of blood and needs to be emptied at an interval of 4–12 h, depending on the menstrual flow. Its cost ranges between Indian rupees ₹500 to ₹2000. While the device needs to be boiled once a month, it can last for 5–10 years if properly maintained, thus is also environment friendly compared to other products.<sup>12</sup>

The usefulness of MC has been reported in many high-income countries,<sup>13,14</sup> however, emptying the MC in public toilets or schools poses as a challenge.<sup>15</sup> Studies in low-income countries have reported that the MC use among adolescent girls and women is influenced from the peer and social media. However, the analysis on feasibility of using MC was missing in those studies.<sup>2,16</sup>

In India, according to NFHS-5, 77.3% of girls and women use sanitary pads for managing their hygiene and sanitation during menstruation.<sup>17</sup> Even a century after its invention, the MC is the least popular alternative for Indian women, and its adoption is much lower compared to sanitary pads.<sup>18</sup> According to a descriptive survey in Mangalore, India, whereas 82% of 300 women were aware of MCs, only 2.6% use them.<sup>19</sup>

According to a systematic review and meta-analysis on the safety and acceptability of MC, it can be adopted as a safe product for menstrual management. Authors suggested for future research to examine the facilitators towards MC use and document any adverse outcomes.<sup>15</sup> There is limited study that explicitly describe about the experiences of MC users, specifically in LMICs. This study intends to explore the experiences and challenges encountered by the women using MCs.

## 2. Material and method

### 2.1. Study design, setting and participants

A qualitative explorative study among a total of 26 MC users was carried out using the In-Depth Interview (IDI) guide. All participants had experience of using MCs for a minimum of three consecutive menstrual cycles. Initially, five eligible participants were identified from the host institute, after doing an exploratory survey. Further, other participants were identified and recruited using snowball sampling technique. Our study participants belonged to the states of Odisha (n = 8), Agartala (n = 9) and Assam (n = 9), India. All study participants were professionals, working and residing in cities like Delhi, Mumbai, Bhubaneswar and Rourkela.

### 2.2. Data collection procedure, management, and analysis

The participants were interviewed telephonically by the trained researchers in Odia or Hindi language using the IDI guides. In order to enhance the credibility of the findings, we followed the source and investigators triangulation approach. We have presented detailed information regarding the participants' income and profession. However, women were basically from – public and private sectors – participated in this study. The researchers who collected data were females (NP, KP and SD) and from nursing, public health and physiotherapy backgrounds. All the researchers had completed their master's degree in public health and have work experience in the field of public health, social and behavioural health and equity for more than two years. The senior researcher also provided training to the researchers regarding the data collection method.

IDI guide comprised of questions along with probes and prompts to elicit their willingness to use MCs, their experiences while using, and the challenges they faced. Data collection was continued till we obtained the data saturation and when no new information was emerged. The interviews were audio-recorded followed by transcription of verbatim and translation into English. Data were analysed using the qualitative thematic analysis method and MAXQDA (VERBI Software, Berlin, Germany) software. The emerged codes and categories are provided in Table 2.

## 3. Ethical consideration

The study was approved by the institutional ethics committee of the ICMR-Regional Medical Research Centre, Odisha, India. Prior to the interview, participants were clearly told about the purpose and the voluntary nature of their participation with flexibility to withdraw at any point in time. Verbal consent was obtained from each respondent.

## 4. Result

### 4.1. Participant characteristics

The study participants belonged to the age group between 25 and 37 years with a mean age of 29.6 ( $\pm 0.91$ ) years. Their average duration of their MC use was 2.4 ( $\pm 0.34$ ) years. All participants were well educated with minimum of master's degree in different disciplines and working in different professional fields. Among 26 participants, 13 (50%) were married and one had a living child. The detailed participant characteristics are given in Table 1.

### 4.2. Reason for adopting MC

Majority of the participants claimed that, MCs were long-lasting, reusable and pocket-friendly products compared to sanitary pad. Monthly they had to spend INR 150–200 for purchasing sanitary pads for one cycle, whereas a single MC costing about INR 300 could be used for more than five years. One participant mentioned that:

“Even a small sanitary pack of 6 pads costs about 150 bucks” (P9)

Further, some participants expressed their concern that wearing sanitary pads, led to development of unpleasant rashes which was worse during Summer. Despite this, all had used sanitary pads because of lack of their awareness and non-availability of a safe alternative.

“I easily got rashes while using pad. During periods, rashes start during initial 3 days and last for 10 days. That was very painful and embarrassing. That's the sole reason why I switched to MC” (P21)

Feeling of bulkiness in the underpants, moist sensation, and efforts to place the pad precisely inside the underwear, were reasons for dissatisfaction.

“I was never ever comfortable using sanitary pads. Even though advertisement on television show how you can perform activities comfortably while using sanitary pad, I could hardly relate to it in reality.” (P14)

A few participants expressed their concern regarding disposal of used

**Table 1**  
Characteristics of participants.

Sl. No.	Characteristics	(n)
1	Age (years, mean $\pm$ SD)	29.6 ( $\pm 0.91$ )
2	Average duration of MC use	2.4 ( $\pm 0.34$ )
3	Marital Status	13
	Married	13
	Unmarried	
4	Average income	
5	State-wise	8
	Odisha	9
	Agartala	9
	Assam	
6	Current location	8
	Delhi	9
	Mumbai	4
	Bhubaneswar	5
	Rourkela	
7	Profession	24
	Private	2
	Public	

**Table 2**  
Emerg ed codes and categories.

Categories	1. Reason for adopting MC	2. Experience of using MC	3. Challenges to ensure a sustainable use of MC	4. Perceived barriers in adopting MC
<b>Codes</b>	Affordability, side effects, discomfort, disposal issue	Positive experiences, negative experiences	Sterilization, accessibility and availability, lack of knowledge	Affordability, lack of awareness, social taboos, access to hygienic place

Results from this study have been identified and depicted under four overarching categories (1) Reason for adopting MC, (2) Experience of using MC (3) Challenges to ensure a sustainable use of MC and (4) Perceived barriers in adopting MC. The findings are presented under each category, supported with quotes from the respondents.

pads. Changing pads at regular interval poses a major challenge, specifically when they were outside home.

“Especially women who go to office and work, it makes their lives very easy. There’s no headache of disposing and changing.” (P8).

Also, majority explained that the MCs are not just only a sustainable product but eco-friendly too compared to sanitary napkins and tampons. One participant mentioned:

“Many reasons for adopting MC. First, it is eco-friendly. I try such things which are environment friendly and ecologically sustainable. So, I started using MC.” (P13)

#### 4.3. Experience of using MC

##### 4.3.1. Positive experiences

According to participants, using MC was easy, convenient, and comfortable. Further, compared to sanitary pads, MC use was more convenient and comfortable, when they go outside because of no need for discarding and changing. According to a participant, there was a “sense of freedom” while using a MC and performing daily routine activities.

“When you use a MC, you don’t even realize that you’re bleeding, you don’t feel anything. No stream gushing out when you move or shake. That’s so comforting.” (P24)

While majority of the participants stated that they had never experienced a leakage issue with MC, a few had encountered this issue during their initial days of use. The reason they cited was because of the lack of adequate knowledge on its insertion and non-availability of a perfect size cup. This problem gradually got solved with experience in due course.

“I have not experienced any leakage issue till now. I have travelled a lot using the cup. During nights also, there is no leakage problem. The best part is I don’t feel that something is inside.” (P5)

##### 4.3.2. Negative experiences

A few participants narrated their apprehension on using a MC. The reasons for apprehension were lack of proper information on how to use a MC and absence of a support system in case anything goes wrong while using. One health care participant expressed her experience about the difficulty in inserting the MC among sexually inactive girls. According to another participant, during her initial days of MC use, when it was not correctly placed, she felt a pricking sensation which was uncomfortable.

“If it is not placed properly and fully inside, I felt like something is pricking me.” (P13)

Only a few participants mentioned about the difficulty in removing the inserted MC. While most could remove it on the first try, some managed to remove after many attempts. This caused them stress and anxiety during the early days. According to a participant,

“Inserting a MC was easy. But removing it was too difficult and pathetic. I was inside the washroom for an hour struggling to remove. I literally cried. Then I asked my friend, and she helped me. (P12)

Another issue with MC was in knowing and getting an appropriate sized one. A few participants stated that despite trying for all available sizes, none fitted them properly and resulted in leakage. In this regard, one participant commented:

“Yes, fitting of MC is an important issue. For me, S is too small, M is too big. Once I used M size and it popped out. (P26)

Among the participants, some still could not switch over completely to the MC due to their lack of complete trust/confidence on MC. So, they used an additional protection layer even after inserting a cup, especially when they would go out. The reason was they never found an appropriate size MC, that was thoroughly comfortable. Moreover, enormous patience, practice, and familiarity with the product is required in getting an appropriate sized one.

“I even use a panty liner along with the cup during the first two days of my menstruation.” (P23)

#### 4.4. Challenges to ensure a sustainable use of MC

The MC users encountered substantial challenge in ensuring sterilization of MC when they were outside home. Further, when they were in a hurry, it was not feasible to use a MC. Hence during such events, they preferred sanitary pad. Another significant challenge was inadequate knowledge on the use of MC and its sterilization process. Even though the participants had gathered information by searching from social media, they felt it to be inadequate.

“The shocking part was, when I consulted a gynaecologist about my leakage, she said she does not know about MC. If a doctor is not aware, then who will help us?” (P19)

Furthermore, due to non-availability of MCs in local markets and pharmacies, users don’t feel MC as a suitable alternative. Only online availability of the product hinders its accessibility to many.

“I remember that once I was travelling and while handling the cup, I dropped it in the toilet and lost it. I went to pharmacy shops and even a mart, but couldn’t find.” (P20)

#### 4.5. Perceived barriers in adopting MC

Participants stated that MC is cost-effective and economical due to its reusability, however, its initial cost would be a barrier among low socio-economic group of women to afford its purchase. Free distribution of MC along with education and training on its usage could help the women and adolescent girls across all groups to adopt.

“Affordability is a major factor. No doubt it is a onetime investment, but that onetime investment is also huge for many. A good silicon-based MC will cost around 1000/- INR.” (P23)

Young unmarried girls may not be comfortable in inserting a MC because of exiting taboos around menstruation and virginity. Further, lack of toilet with adequate water supply would create challenge in using MC.

“You can use a sanitary pad in public toilets, because you are not coming in contact with anything. But while using a MC, you need a clean washroom along with adequate water supply.” (P23)

Further, MCs are not widely used due to a lack of knowledge among the reproductive age group women as the product is not widely available, lack of any awareness campaign and advertisements about the product.

"Lack of information and awareness is a huge issue. Even though sanitary pads are advertised so much, still people are not open to use it, then how would we expect people to use MC, when there is no advertisement?" (P8)

Based on the factors influencing for adopting and using MC, a conceptual framework is outlined in figure-1. The factors are depicted under three categories as Dependable factors, Independent factors and Mediating factors.

Our study also observed the differences between the practice of sanitary pad and MC. The differences under various characteristics are presented in Table-3. As all the participants stated that before adopting a menstrual cup as a sanitary product, they were using a sanitary pad. While using the sanitary pad they have faced a series of challenges, and discomfort for which they adopted MC as an alternative. We have presented Table 3 to compare both products which helps readers to get the detailed information regarding various context-specific factors associated with both the products.

### 5. Discussion

This qualitative study was based on the experiences and perceptions of MC users to understand whether MC could be an alternative method in menstrual hygiene management. While most of the findings towards MC use were found positive and encouraging compared to conventional sanitary pad, there were also a few shortfalls with MC use. The MCs were found to be more economical, safe, convenient, and environment friendly. The motivation to use MC among participants was ingrained in the detrimental experiences of their earlier use of sanitary pad such as developing rashes, bad odour, discomfort, and disposal issue. While most of those concerns got addressed after switching over to MC, still a few users were worried about the lack of availability of appropriate size cup for them, often causing leakage. Most of such MC related issues got resolved in due course with experience of using.

Other studies from India and other countries have also reported the benefits of MC use. Similar to our finding, studies from LMICs have demonstrated MC use to be practical, safe and convenient.<sup>3,20</sup> In a study from Canada, researchers have revealed that females using MC were having higher satisfactory rate.<sup>21</sup> In a clinical investigation study in South Africa, MC was found to be better in terms of quality and comfort compared to sanitary pads/tampons.<sup>22</sup> According to a study from Kenya,

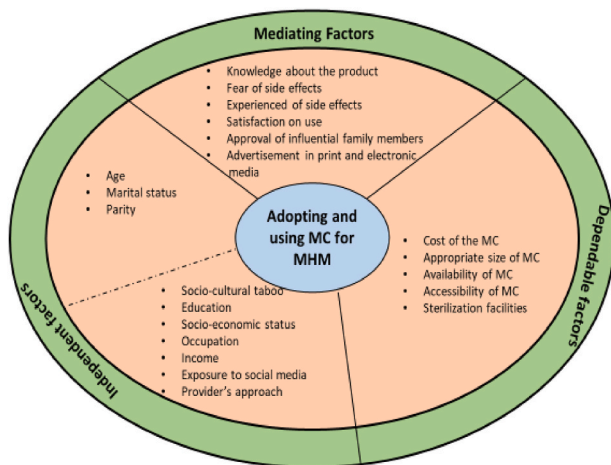
**Table 3**  
Comparison between Sanitary pad and Menstrual cup.

Condition/Situation	Sanitary pad	Menstrual Cup
Cost	<ul style="list-style-type: none"> <li>Need to be purchased frequently (every month).</li> <li>Per cycle cost is around 100–150 INR (monthly)</li> </ul>	<ul style="list-style-type: none"> <li>Need to be purchased once for about 5 years.</li> <li>Initial cost is high (300–1000 INR) but economical in long run (can be used up to 5 years)</li> <li>Available only through online business platforms.</li> </ul>
Availability	<ul style="list-style-type: none"> <li>Easily available in pharmacies and supermarkets.</li> <li>Free distribution of sanitary pad by Government and NGOs</li> </ul>	<ul style="list-style-type: none"> <li>No major side effect</li> </ul>
Side effects	<ul style="list-style-type: none"> <li>Possibility of side effects such as rashes, infection</li> </ul>	<ul style="list-style-type: none"> <li>Disposal is not required.</li> <li>Needs proper cleaning with adequate water for reuse.</li> </ul>
Disposal	<ul style="list-style-type: none"> <li>Each used pad needs to be disposed as a biological waste.</li> <li>Less water is required for changing to a new pad.</li> </ul>	<ul style="list-style-type: none"> <li>More eco-friendly compared to sanitary pads.</li> </ul>
Effect on Environment	<ul style="list-style-type: none"> <li>Non-biodegradable product, not environment friendly.</li> </ul>	<ul style="list-style-type: none"> <li>Clumsy to handle when outside home (workplace and public place).</li> <li>Requires proper sterilize and storage.</li> </ul>
Convenience	<ul style="list-style-type: none"> <li>More convenient when outside home.</li> </ul>	<ul style="list-style-type: none"> <li>Losing virginity (among adolescent girls and unmarried women).</li> <li>Initial apprehension about wrong placement, removal problem.</li> </ul>
Sterilization	<ul style="list-style-type: none"> <li>Not needed (one-time use).</li> </ul>	<ul style="list-style-type: none"> <li>Very comfortable when a fitting sized MC is properly placed.</li> <li>Very much required (identifying the proper size, proper placement, removal, sterilization and storage).</li> </ul>
Perception	<ul style="list-style-type: none"> <li>No such negative perception (used externally).</li> <li>No apprehension of any major problem.</li> </ul>	<ul style="list-style-type: none"> <li>Very much required (identifying the proper size, proper placement, removal, sterilization and storage).</li> </ul>
Comfort	<ul style="list-style-type: none"> <li>Discomfort with bulky feeling.</li> <li>Not required</li> </ul>	
Experience/guidance		

once the MC is properly inserted and placed, the user felt active and confident,<sup>12</sup> which were consistent with our finding. Another study from Africa reported that, MC helps to alleviate physical and social distress.<sup>23</sup> Similar to our findings, a study from Gujarat, India, indicated that females between 20 and 50 years preferred using MC because it was convenient, had less odour and least side effects.<sup>24</sup> As the product is available only online, so it has been accessible only for the educated adult group. Further, the adoption of MC minimises the economic burden and menstrual waste compared to the use of sanitary pads.<sup>19</sup> Moreover, 70% of the participants intended to continue using MC as stated in a systematic review and meta-analysis.<sup>15</sup>

While most of our participants expressed their concern about the leakage issue during their initial days of MC use, they blamed it on incorrect insertion and positioning of the cup and non-availability of an appropriate size cup. According to a study among school-aged girls, sanitary napkins are mostly used due to a lack of awareness on MC.<sup>25</sup> Non-availability of MC in local markets and pharmacies limits their options for MHM. Further, present study reveals that removing MC was difficult at times, which is consistent with previous research.<sup>13,24</sup> Oster and Thornton reported that MCs have the benefit of being easy to clean and requiring less water, so they can be considered in locations with restricted water supplies.<sup>16</sup> In contrast to this, we found that adequate water supply along with clean washroom facility is essential for MC use. In Indian context, there are taboos existing on MHM and it is still considered to be unhygienic. That is why our participants mentioned the need of adequate water to properly clean the MC for reuse.

Present study revealed that emotional support is essential during the initial use of MC; yet, due to sociocultural orientation of menstruation,



**Fig. 1.** Conceptual framework on factors associated with adoption and usage of MC.

women may be reluctant to seek help. Moreover, they were judged by the peers for inserting a product into the vagina when sanitary pad is available. In contrast to our finding, a study from Nepal reported that peer exposure could increase in MC adoption.<sup>12</sup> Existing literature also suggest that sustainable MHM by adopting MC could be achieved through strategies like strengthening communication, creating health support groups, and involving community health care workers.<sup>26</sup> Another study suggested that as compared to sanitary pad and tampon, menstrual cup is a safe, sustainable and cheaper. However, proper advertisement is highly required in order to change the existing practice of using menstrual product among women.<sup>27</sup> MC is an eco-friendly menstrual management alternative which offers an affordable and sustainable period product. It has ecological, economic, and environmental benefits. A “sense of freedom” among MC users has transformed their lifestyle, and empowered them. Our study advocates for government initiatives on availability of affordable MC, provision of comprehensive training on techniques, hygiene safety, promotion of awareness using electronic and print media for wider acceptability of MC. Present study participants were adults, well educated, employed, empowered, and belonged to middle or upper socio-economic strata. Thus, the generalizability of the results across other groups needs to be done cautiously. The findings of the present study have excellent value for adding knowledge to the existing literature. The evidence generated from this study will aid policymakers, healthcare professionals and program implementers to learn more about the potential advantages and disadvantages of using a MC hence can create awareness among women which could ultimately help in better reproductive health outcomes. This study has some limitations. Participants were educated, employed, empowered, and belong to the middle or upper socio-economic strata of the society. Thus, the generalizability of the results with uneducated and low socio-economic groups can be difficult. Further, our study could not explore the complexities of using MC among virgin girls.

### 5.1. Implication of policy and practice

The results of our study offer evidence regarding the experiences of women who have adopted MC as an MHM product. It is critically significant to have a clear reproductive policy guideline on the education, training, and capacity building of women regarding their choices for menstrual products and its usage. The evidence generated from this study will aid policymakers and healthcare professionals to learn more about the potential advantages and disadvantages of using a MC, hence can create awareness among women for a better reproductive health outcome.

## 6. Conclusion

MC is an effective and convenient alternative period product for MHM among urban educated and self-independent women. Though some initial challenges such as proper insertion, removal and ensuring product hygiene were encountered, they got resolved with time. Future research exploring the socio-cultural aspects along with proper strategies would improve the acceptability and MC use.

### Declaration of competing interest

The authors declare no competing interests that could have appeared to influence the work reported in this paper.

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