

Menstrual Cup: A Sustainable Solution For Menstrual Hygiene

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Abstract- Menstrual hygiene management (MHM) remains a critical yet under-addressed public health challenge, particularly in rural and peri-urban communities of developing nations. Inadequate access to safe, affordable, and sustainable menstrual hygiene products continues to affect the health, dignity, education, and socioeconomic participation of millions of women and girls. The menstrual cup, a reusable silicone-based intravaginal device designed to collect menstrual fluid, has emerged as a promising alternative to conventional disposable products such as pads and tampons. This paper presents a comprehensive research study examining the menstrual cup as a sustainable solution for menstrual hygiene management. Through a mixed-method approach encompassing a structured survey of 200 participants (comprising rural and urban women aged 15–45), field observations, and literature synthesis, the study evaluates awareness levels, acceptability, usage patterns, advantages, and socio-cultural barriers associated with menstrual cup adoption. Findings indicate that while awareness of menstrual cups remains significantly low in rural areas (approximately 18%), urban acceptance is comparatively higher (approximately 62%). Key advantages identified include cost-effectiveness over long-term use, environmental sustainability (reduction of menstrual waste), health benefits (lower risk of toxic shock syndrome and infections), and enhanced convenience. Major challenges include cultural taboos, lack of awareness, initial discomfort during insertion/removal, and limited access to clean water for maintenance. The study concludes with evidence-based recommendations for policy interventions, community outreach programs, and educational campaigns to foster wider adoption of menstrual cups, especially among underserved populations.

Keywords: Menstrual Cup, Menstrual Hygiene Management, Sustainable Menstruation, Rural Health, Reusable Menstrual Products, Women's Health, Eco-friendly Hygiene

I. INTRODUCTION

1.1 Why Menstrual Hygiene Still Needs Attention

Menstruation does not pose as much difficulty for women as much as the circumstances surrounding it, which affect how many of the 336 million women in India who are currently menstruating. There are many women, particularly in rural areas, who use old clothes, rags, or other substitutes for sanitary products because they do not have access to convenient, low-cost sanitary products. When women have access to disposable sanitary pads, there are still issues concerning the long-term environmental impact, re-purchase costs, safety of products that have not been resolved.

The National Family Health Survey (NFHS-5, 2019-2021) estimates how many women aged from 15 to 24 use hygienic menstrual protection and found that about 77.3% did while still representing a sizeable jump from the past (57.6% from NFHS-4). More troubling, this means that nearly a quarter of young Indian women do not have access to hygienic menstrual protection.

Additionally, in some rural districts in Maharashtra, Rajasthan, Bihar, and Uttar Pradesh, the percentage is estimated to be approximately 70%. There is a woman behind every percentage point, attempting to manage her period without dignity.

The Problem with Disposable Pads

The public health response to poor menstrual hygiene in India has revolved almost exclusively around the dispensing of disposable sanitary napkins. Disposable pads have been promoted as the solution through the government's Suvudha pad under the Jan Aushadhi scheme, various state-level free pad distribution programmes and corporate CSR initiatives. These efforts are well-intentioned and beneficial. But they have also pinned some new problems to the ground.

India generates an estimated 12.3 billion sanitary pads every year. These pads are essentially made of plastic

and super-absorbent polymer gel (SAP), which is not biodegradable. In rural regions where waste management infrastructure is limited, used pads are burned (emitting toxic fumes), buried or just tossed into fields, waterways and drains. The recurring cost of pads — about INR 80– 120 per month for a woman — is also an undeniable economic burden on households in the lower two income quintiles, where this amount can be the difference between a meal or a pad.

The Menstrual Cup: A Different Kind of Solution

Menstrual cups, which have been sold on the sales market since the late 80s but have gained most of their recent popularity and awareness in India over the past ten years via the use of social media, urban health advocates and NGO-led campaigns. This cup is a small device made out of medical-grade silicone, and its shape is similar to that of a bell. Menstrual cups are placed inside the vaginal canal through folding, and they collect rather than absorb menstrual blood. These cups can stay in place for up to 12 hours, and once removed, emptied, cleaned in cold water and placed back inside the vagina. After a woman has had her period that month, she can sterilise the cup by either boiling it in water or using one of the numerous sterilising solutions available to her. A cup normally costs anywhere from Rs. 200-Rs. 800 (depending on brand), and will last between 8-10 years.

The menstrual cup's ability to address several issues (e.g., price, environment, cleanliness, and accessibility) provides an opportunity to warrant thorough and serious field research. This study's goal was to investigate how familiar women in rural and urban Maharashtra are with this product, how many women are interested in using it, their concerns regarding using this product, and what factors would need to be addressed for broader usage of this product to occur.

Scope of This Study

Conducted across two different settings – Pune city (urban) and Nandurbar district (rural) in Maharashtra – this study aimed to compare grounded realities of menstrual health management. Based both on quantitative survey data about women aged 15 to 45 and qualitative conversations with participants, the study.

II. OBJECTIVES OF THE STUDY

Primary Objectives

- To determine the existing knowledge of the menstrual cup in rural and urban women of Maharashtra.

- To learn about acceptance, willingness and actual usage patterns across age groups and socio-economic backgrounds.
- To assess the benefits of menstrual cups compared to traditional single-use menstrual products in terms of economic, environmental and health criteria.
- To identify and document the key barriers — practical, cultural and infrastructural — that restrict the uptake of menstrual cups.

2.2 Secondary Objectives

- Using both primary data and NFHS-5 national data to understand menstrual hygiene practices among rural and urban women.
- To assess the impact of demonstration and education on MPs willingness to adopt the menstrual cup.
- To formulate evidence-based recommendations for government, NGO s, schools and health workers in order to advocate sustainable menstrual hygiene practices.

III. LITERATURE REVIEW

Menstrual Hygiene as a Public Health and Gender Issue

Sommer and colleagues (2015) [13] have demonstrated that menstrual hygiene management should be viewed as a public health issue, rather than something private that just women have to deal with and hide. Their research indicates that the shame associated with menstruation and the lack of infrastructure hinder the ability of women to manage their menstrual hygiene effectively; as a result, women face both direct and indirect health and social consequences such as reproductive tract infections, dropping out of school and limited ability to engage in public life. Further supporting this conclusion, UNICEF and WHO (2019) [18] are now including menstrual hygiene in their global WASH (water, sanitation and hygiene) agenda; they also recognise that menstrual hygiene cannot be separated from the goals of gender equity and human dignity.

In a review of much of the research relating to MHM interventions in low and middle-income countries, Hennegan and Montgomery (2016) [16] provide evidence that the combination of product provision with structured education and open communication about menstruation has more significant benefits than when product provision is done in isolation. They provide evidence that participation in an MHM programme using the integrated approach is correlated with improved hygiene, increased confidence of girls, increased school attendance and improved psychosocial wellbeing. Therefore, it is clear that simply providing women with a

menstrual hygiene product will not provide the same level of benefit as when products are provided as part of a greater integrated approach.

The Menstrual Cup: Evidence on Safety and Effectiveness

The systematic review and meta-analysis published by van Eick et al. (2019) in *The Lancet Public Health* is the most comprehensive global review of menstrual cup evidence to date. They analyzed 43 studies with a total of 3,319 participants from various countries. The main finding was that the menstrual cup had leakage rates comparable to or lower than disposable pads or tampons. In addition, 73% of participants were willing to continue using the menstrual cup after completing their trial period, a strong indicator of acceptability once the initial adjustment period has been completed.

Manley et al. (2021) published in *Women's Health* also recognized that menstrual cups come in numerous design, size, firmness and material variations; establishing standardized categories for menstrual cups will help new users identify a menstrual cup that fits properly and comfortably. This is particularly relevant because many first-time users in India do not find satisfactory menstrual cups since they have not been fitted with a cup that meets their size or firmness requirements.

Indian Context: Awareness and Field Studies

In a qualitative research article published in *Clinical Epidemiology and Global Health*, Patel et al. (2022) [7] interviewed twenty- six Indian women between the ages of twenty-five and thirty-seven who used menstrual cups, giving them an in-depth understanding of their experience with this type of product. Women reported that menstrual cups were cheaper, easier to use, and caused less irritation than disposable pads. They noted the 12-hour time frame during which they could wear their menstrual cups as something they particularly valued when travelling or working. The study participants cited poor experiences with disposable pads as the primary reason for switching; rashes from using pads, leaking, and discomfort from wearing them were the main reasons for switching to a menstrual cup. This research shows that if women have access to adequate information about a menstrual cup and have an opportunity to use one; they will naturally adopt this new form of menstrual product.

Singh et al. (2022) [11] used the NFHS-5 database to evaluate the factors associated with using hygienic menstrual products exclusively by 95,551 rural adolescent females (approximately 25% of the total sample). They found that

education level, household wealth quintile, and access to a toilet equipped with water were positively associated with the exclusive use of hygienic menstrual products (the dependent variable). In addition, Chakrabarty et al. (2023) [2] examined the rural-urban divide in the exclusive use of hygienic menstrual products and found that there was a 25% difference between the rural and urban settings (i.e., rural adolescent women used fewer hygienic products than urban adolescents) as well as substantial variation by state (i.e., there were large differences among states regarding how many rural and urban adolescent girls used hygienic products). These findings indicate that to reduce the rural-urban divide in hygienic menstrual product use, we will need to implement programmatic interventions as opposed to relying solely on economic development.

Environmental Case for the Menstrual Cup

Research by Fourcassier et al. (2022) [3], using a lifecycle assessment approach in *Cleaner Environmental Systems*, indicated that menstrual cups have significantly lower CO₂ equivalent emissions and generate significantly lower amounts of solid waste across a 10-year period compared to disposable pads or tampons. The research conducted by Prima Citta et al. (2024) [10] on consumer preferences in Japan, Indonesia, and France through a discrete choice experiment found evidence that environmental sustainability is cited as a recognized benefit of cups. However, competing preferences such as convenience, familiarity, and accessibility affect the adoption rate of cups across all consumer markets.

Why People Don't Use Cups: The Barrier Literature

Kaur, Kaur & Kaur (2018) [6] conducted a study of the landscape of menstrual hygiene in developing countries, highlighting the ways cultural norms regarding requirements for purity, body shame, and secrecy create strong barriers to any menstrual practices engaging the user's body or anatomy. Phillips-Howard et al. (2016) [8, 9] noted specifically that intravaginal products require a level of familiarity with human anatomy, as well as comfort with touching oneself down there, that many girls and women in India have never had an opportunity to achieve – thus recommending that programs promoting menstrual cups must include an introduction to reproductive anatomy education with their participants.

The literature as a whole provides very strong evidence that menstrual cups have successful usage rates, many women are open to using them, once they are given sufficient education regarding them and are given an opportunity to try them, and there are indeed barriers to using

menstrual cups, but they are barriers of knowledge, infrastructure, and cultural practices, and do not relate to the quality of the product.

IV. RESEARCH METHODOLOGY

Research Design

In this investigation, the researcher employs a descriptive cross-sectional mixed-methods approach. Quantitative data was obtained using a structured questionnaire designed to allow for statistical comparisons between both rural and urban populations. The researcher then utilized semi-structured interviews and focus group discussions (FGD) to obtain qualitative data with a variety of experiences and attitudes that numbers cannot convey. The quantitative and qualitative data were analyzed separately, and then merged in a triangulation process to produce a more complete picture.

Study Sites

The urban location in Pune City, Maharashtra includes two wards which contain representative samples of middle and lower- middle-class urban households, that have some access to digital media and retail stores but experience different levels of health literacy.

The rural location is in the Nandurbar District, Maharashtra, and contains two villages selected because of a lack of healthcare infrastructure, low level of awareness surrounding modern menstrual hygiene products, and high reliance on health information from community health workers.

Sample and Sampling

In total, there were 200 women between 15 to 45 years old to take part in this research, 100 from Pune (an urban community) and 100 from Nandurbar (a rural environment), with participants being chosen via stratified random sampling within each area. The women were stratified by age to ensure each of the life stages were represented.

Table 1: Study Sample Distribution by Age Group and Location

Age Group / Category	Urban – Pune	Rural – Nandurbar	Total
Adolescent Girls (15–19 yrs)	25	25	50
Young Women (20–29 yrs)	35	35	70
Adult Women (30–45 yrs)	30	30	60
Prior menstrual cup users	10	10	20
Total	100	100	200

Data Collection

Structured Questionnaire

The 35-item pretested questionnaire assessed: demographics, current menstrual hygiene practices, knowledge about the menstrual cup, where the participant learned about the cup, feelings toward use of the cup, previous experiences using the cup, and perceived barriers to using the cup. The questionnaires were developed in both English and Marathi; the Marathi version was back translated and tested by community health workers prior to use in the study.

Semi-Structured Interviews

Using purposive sampling, 20 women (10 from urban and 10 from rural areas) were selected to participate in in-depth (30-45 minute) interviews. These interviews were conducted to explore women's experiences with managing their menstrual hygiene, their responses to using a menstrual cup, the impact of family and social support on their choice of menstrual hygiene product, and what would increase the acceptability of the menstrual cup within their communities.

Focus Group Discussions

A total of three FGDs were completed; one was conducted in Pune, while the additional two were conducted in Nandurbar and the surrounding villages. Each FGD contained between 6 to 8 adult female participants. The FGDs were facilitated and recorded (with consent) by a trained female field investigator in Marathi. The FGDs examined community norms, family dynamics, and collective attitudes toward new menstrual products.

Ethical Considerations

Written informed consent was collected from all individuals prior to any data collection being done. For Informed Consent Forms (ICFs) from individuals under 18 years of age, additional parental or guardian consent was also required to be collected. No w/ personal identifiers are used in the storage of participants' data and they can withdraw at any point in time from study participation; no financial incentives have been offered as inducements for participation in the study. The study protocol has been approved by the Institutional Ethics Committee.

Analysis

Microsoft Excel was used to store quantitative data before analyzing in SPSS (version 23). Descriptive statistics

(frequency counts and percentages) were calculated for all items collected. Chi-square tests were conducted to assess associations between location (rural versus urban), education levels, age groups, as well as awareness or willingness variables. Qualitative transcripts were lysed using thematic analysis based on Braun and Clarke's (2006) [1] six-phase framework.

V. DATA ANALYSIS AND FINDINGS

Who We Spoke To

Average age for 200 persons (M=26.4, SD=7.8); as compared to a urban only (M=82%) or rural only (M=44%), which is an equal proportion of them. In addition, Monthly household income was: Rural INR 3,000 - 15,000; Urban INR 8,000 - 50,000; Urban = 94% used their cell phone; Rural = 38% owned a smart/cell phone.

Current Menstrual Hygiene Practices

In regards to what they primarily used for their menstrual products, urban areas had a higher number of people using disposable pads than those in rural areas (74% vs. 52%); however, the remainder of respondents in rural areas were spread out among different types of products, with 36% using reusable cloth and 9% using homemade materials. There was also very little use of menstrual cups in either area, but none at all were found in the rural area. For the complete breakdown of the amount of each type of product being used, please refer to Figure 2 below.

Table 2: Current Menstrual Hygiene Practices by Location (n = 200)

Product Used	Urban (%)	Rural (%)	Overall (%)
Disposable Sanitary Pads	74	52	63.0
Reusable Cloth Pads	8	36	22.0
Tampons	12	2	7.0
Menstrual Cup	6	1	3.5
Homemade / Old Cloth	0	9	4.5

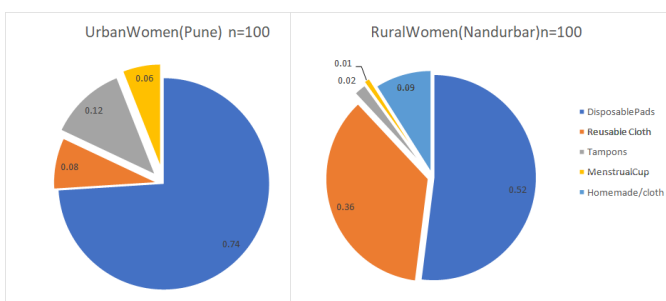


Figure 2: Menstrual Product Usage — Urban vs Rural Women (Pie Chart Comparison)

Awareness of the Menstrual Cup

The researchers posed the following question to each participant: 'Before today, had you already been aware of the menstrual cup? Women in cities were more likely than women in less populated areas to say that they had heard of the menstrual cup (62% vs. 18%) ($\chi^2=37.24, p<0.001$), with urban women being over three times more likely than rural women to report prior knowledge of the product. Further analysis revealed that aged 30-45, women living in rural areas were far less likely to have learned about the menstrual cup relative to older women living in cities than about any other product, and this may be due to less access to digital and media-based health promotions in this age range.

The study's participants cited the following sources for their knowledge of the menstrual cup:

- Sources of information for urban women: social media as a source of information for 48% of urban women; their mothers, friends; a physician as a source of information for 14% of urban women; and television for 10% of urban women.
- Sources of information for rural women: 44% of rural women would cite their community health worker/ASHA as a source of information; 32% would cite Centre-based health camps run by NGOs; 18% would cite a friend or family member for referral to the product; and only 6% would cite social media as being a source of information.

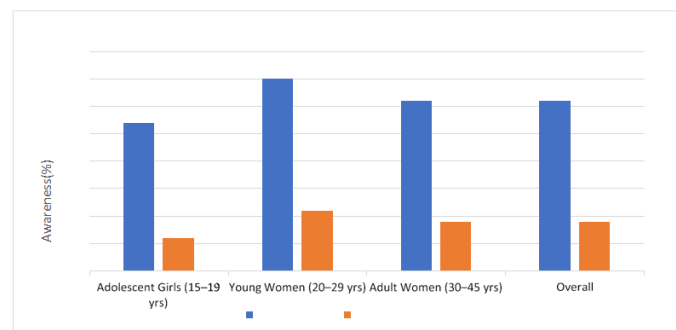


Figure 1: Awareness of Menstrual Cup by Age Group and Location (n = 200)

Willingness to Try or Continue Using the Cup

Once participants had completed a brief informational session and watched a live demonstration (using a model cup), they were asked if they were willing to use a menstrual cup. Both groups saw an increase in their willingness to try a menstrual cup post- session than they had pre-session:

Table 3: Willingness to Use Menstrual Cup — Before and After Demonstration (*Intend to continue)

Group	Pre-Demo Willingness	Post-Demo Willingness	Change
Urban Women (Pune)	48%	73%	+25%
Rural Women (Nandurbar)	28%	41%	+13%
Prior cup users (both sites)	85%*	—	—

According to the study, the primary motivations for women considering an option to switch to cloth were: a) to save money in the long-term; b) to protect the planet; c) to gain access to a more convenient option during days of heavier menstrual flow; and d) to reduce the potential for infection. Interestingly, none of the 20 women already using menstrual cups stated that they would return to disposable pads.

Barriers to Adoption

Women who did not want to try the cup or were not sure about it were asked to give their reasons. They could choose than one reason. Here are the results, in Figure 3.

Table 4: Barriers to Menstrual Cup Adoption — Percentage of Non-Users Citing Each Barrier

Barrier	Urban (%)	Rural (%)	Overall (%)
Fear of insertion/discomfort	58	72	65.0
Lack of awareness/information	18	66	42.0
Cultural/religious objections	22	61	41.5
Not available in the local market	8	52	30.0
No access to clean water for cleaning	6	48	27.0
Partner or family disapproval	10	38	24.0
Cost of initial purchase	14	31	22.5

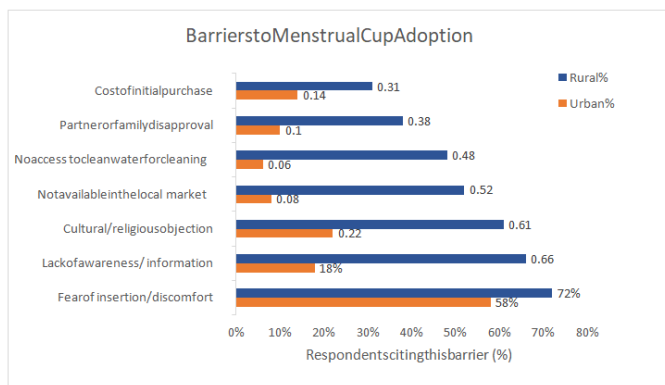


Figure 3: Barriers to Menstrual Cup Adoption — Urban vs Rural Comparison (Horizontal Bar Chart)

VI. RESULTS AND DISCUSSION

The Awareness Gap is Real — and Addressable

The gap in awareness of menstrual cups between urban (62%) and rural (18%) women is significant at 44 percentage points; however, this result isn't surprising. It fits into a larger historical trend identified in the NFHS-5 dataset from Chakrabarty and others (2023) [2]. Namely, urban, educated, and connected women receive information about modern health products and practices before rural women have access to it. Due to the small number of health camps and poor access to the internet in rural areas, women in rural locations—such as Nandurbar—lack the information that would allow them to consider menstrual cups as an option.

The good news is the outcome of the demonstration session conducted by ASHA workers and ANMs. A 20-minute individual demonstration on how to use a menstrual cup (demonstration of technique for folding and inserting) and subsequent answering of the consumer's questions led to increased willingness to try by 25 percentage points in urban areas and 13 percentage points in rural areas immediately following that time. This demonstrates that the barrier to using the menstrual cup is not due to an inherent dislike or rejection to it; rather, it can be attributed to the lack of education on this product. ASHA workers and ANMs trained to provide information and demonstrate the menstrual cup at the village level could therefore help close a significant portion of the gap between urban and rural women.

The Economic Argument is Compelling — Especially for Rural Households

Participants from Nandurbar living in rural areas spent around INR 80 to INR 120 each month on buying pads or similar materials. Over the course of a year, that amounts to approximately INR 1,000 to INR 1,440. After 10 years, the total cost for an individual woman could range from INR 10,000 to INR 14,400. A menstrual cup, which costs between INR 400 and INR 600, pays for itself in a period of about five to seven months and thereafter has no additional costs. For households that earn between INR 5,000 to INR 8,000 each month, these savings are potentially significant.

This argument against providing menstrual cups — due to the difficulty for poor households to pay for them up front, with costs of INR 400 to INR 600 per cup — is legitimate but not insurmountable. A single demonstration of use of the menstrual cups to a community, followed by distributing subsidised cups through pharmacies (Jan Aushadhi Kendras), public health facilities or health departments, would incur lower costs per beneficiary compared to three months of pad distribution. The economics strongly favour the menstrual cups compared to the other options available.

Environmental Impact: Evidence and Local Reality

Fourcassier and other people who worked with them in the year 2022 found out that reusable menstrual cups are better for the environment than menstrual products. They looked at the life of these products and saw that reusable menstrual cups make a lot less carbon dioxide and plastic waste. In a place called Nandurbar, our people who went to the field saw that used sanitary pads were being burned in open-air dumps. Women who use sanitary pads and our field teams told us that this is something that happens a lot.

In areas where there is no good system to collect waste, menstrual waste often ends up in fields, storm drains and is burned in open flames. If only a quarter of women in these areas began using reusable menstrual cups instead of disposable sanitary products, it would make a significant positive difference for the environment.

In cities, 54 per cent of the women we interviewed said they want to use menstrual cups because they care about the environment. This is similar to what other people, like Prima Citta and their team, found out in the year 2024. They saw that people, younger and more educated ones in Urban India, prefer reusable menstrual cups because they want to be kind to the earth. This is a growing market for reusable menstrual cups, among these consumers.

Health Outcomes: What Current Users Tell Us

In our study, the 20 current cup users reported no adverse events related to the use of their cup, including toxic shock syndrome, infection, or pelvic pain. All users indicated satisfaction with their cup and plan to continue using one. In their meta-analysis of 43 studies on the use of menstrual cups, Van Eijk et al. (2019) found no evidence of clinically significant higher rates of adverse events associated with menstrual cups compared to traditional menstrual products.

Some of the benefits reported by cup users included reduced skin irritation compared to prolonged use of disposable pads, no dryness or irritation associated with tampon use, and the perception that they were not exposing themselves to the synthetic chemicals used in traditional pads, as well as no exposure to chemicals that could be present in disposable pads due to dioxin contamination. While these reports of benefit are anecdotal, they are consistent with the biocompatibility profile of medical-grade silicone materials.

Cultural Barriers: What Women Actually Said

In Nandurbar, focus group discussions showed that not knowing if a woman can do something and wondering if her family will accept it have been two major barriers to using a menstrual cup. Many women aged 30-45 found the idea of touching themselves to use a menstrual cup to be uncomfortable; one woman said, "For generations, we've been told that we're not supposed to touch our bodies at this time of the month. This cup encourages us to do the opposite of what we've been taught."

This type of barrier will not be addressed through product promotion alone. A different level of engagement is required; women in communities need to have conversations in safe spaces, facilitated by trusted women who have a reputation in the community (ASHAs, SHG leaders, schoolteachers), and create a supportive environment that challenges menstrual hygiene with respect for cultural customs of the women within the community. Phillips-Howard et al. (2016) [8, 9] clearly stated this: any introduction of menstrual cups for success must be made with reproductive anatomy education. Kaur et al. (2018) [6] have documented how this issue has been a challenge worldwide among developing nations; this is not something that is specific to Maharashtra. This requires a culturally appropriate patient response led by the community instead of the manufacturer pushing down a product.

What the 'After-Demo' Numbers Tell Us

The most relevant finding of this research study may be the changed willingness to adopt following a demonstration of the menstrual cup in person. Demonstrating the menstrual cup to the clients at the same time as continuing with reproductive health education is a direct implication for ASHA workers and health camps to expand the acceptance of the cup into the existing uptake pipeline. Mass media advertising is not the best method for increasing uptake, but rather having one trusted person in the room who is knowledgeable about how to use the menstrual cup can demonstrate this method for the client and realistically assist the client with understanding how to use the menstrual cup, which may include demonstrations of the messiness, awkwardness, and difficulty of using or learning how to use the menstrual cup.

vii. advantages of the menstrual cup

Economic Advantage

- One menstrual cup would last between 8-10 years for INR 400-800 per cup, compared to the cost of menstruation pads each year (INR 960-1,800).

- Over 10 years, users would save INR 8,500-13,000, making this a substantial benefit for low-income households.
- By providing one menstrual cup as a distribution program, the government is more cost-effective than continuing to purchase disposable menstrual pads.
- The provision of menstrual cups can eliminate or reduce women's period poverty and the resulting inability to attend school or work because they cannot access period products.

Environmental Advantage

- It will remove about 10,000 single-use items for each user over the span of 10 years
- Produces 94% less greenhouse gas emissions and landfill waste (equivalent to landfill disposal) than disposable pads over the same amount of time (Fourcassier et al., 2022).
- Does not contain any plastic, synthetic polymers, or bleach fibres upon completion of manufacturing — there is no waste generated throughout the lifetime of the product.
- Especially important for women living in rural areas where there are no facilities available for solid waste management or where it is common to burn or throw away used menstrual products.

Health Advantage

- There is no chance of developing TSS from prolonged tampon use, because menstruation occurs within the body, and a menstrual cup does not absorb.
- Menstrual cups do not alter the vaginal pH or the natural bacterial flora; there is a reduction in the potential for bacterial vaginosis.
- There are also no synthetic fragrances, dyes, or bleached fibres in contact with sensitive vaginal tissue when a cup is used— therefore, there is a reduced chance of skin irritation and/or an allergic reaction.
- Medical-grade silicone is biocompatible, non-toxic, and ISO (International Organisation for Standardisation) certified: this is the same material that is used to manufacture medical implants.
- When used properly, the leakage protection provided by menstrual cups is at least equal to, or better than, that provided by traditional pads or tampons (van Eijk et al., 2019 [15]).

Practical Advantage

- Can safely be worn all day — great for working girls, students, travellers, and active people.
- Compact and discreet enough to fit in your pocket — no bulky pad packs and no waste disposal issues.
- Perfect for swimming, playing sports or exercising — nothing to shift around or bunch up.
- So no relying on regular supply chains (after initial purchase) or store to make the product available.

VIII. CHALLENGES AND LIMITATIONS

Awareness and Information Deficit

The biggest problem to overcome is that most of the women (especially in rural India) have never even heard of the menstrual cup due to a lack of advertising in the public sphere (commercial or otherwise), no government promotion, and no effective penetration by NGOs into very remote areas. Therefore, it is an information void for most potential users, whereas disposable pads have the advantage of being heavily marketed commercially on a large scale and distributed for free by the government. Menstrual cups depend mostly on word-of-mouth and field-level health workers as their only mode of distribution and promotion. This puts them at a disadvantage because they need a deliberate policy remedy and structural disadvantage.

Cultural and Religious Barriers

Menstruation is considered a dirty word (or a taboo) in many cultures and communities across India, and there are cultural norms associated with the practice that prohibit women from using their bodies when they are on their menstrual cycle. This means that the act of inserting and removing a menstrual cup would be difficult for a woman because these same community standards would stop her from becoming familiar with her body, allowing her to use self-touch to insert or remove a menstrual cup. Many of the women said that their families (especially their mothers-in-law and sisters-in-law) would disapprove of them using a menstrual cup, and this would discourage them, especially for rural, younger women. All of these barriers can be addressed through a combination of community conversations and cultural engagement methods in conjunction with product information.

Initial Discomfort and the Learning Curve

Many people cite fear of discomfort or pain during insertion (65% overall) as the most commonly cited barrier (urban/rural). This is a legitimate fear; most first-time users of menstrual cups report having experienced discomfort, leakage

and frustration for the first one to three cycles of their menstrual period. Without any sort of support to help guide them in use, they tend to give up before they have a chance to learn, especially if they are using a cup that is not appropriate in size/firmness for their anatomy. Therefore, to convert the interest (curiosity) into sustained use, structured, hands-on demonstration programs with follow-up visits will be crucial.

Water and Sanitation Access

Boiling water is necessary to disinfect the cup between each use, while rinsing the cup with clear water is required after every use. Nearly half of the non-users (48%) living in Nandurbar reported a lack of access to clean water to use as one of the barriers preventing them from using a cup. For these women, using a cup discreetly and hygienically poses a significant challenge, especially in conjunction with limited or no access to a functional tap or a private toilet in their village. Improvements to sanitation infrastructure are a requirement for the successful implementation of any promotion programs for cups.

Market Availability

Menstrual cups can be found in pharmacies, grocery stores and online stores in Pune. In contrast, menstrual cups are effectively nowhere to be found in Nandurbar villages. The rural supply chain of menstrual cups runs exclusively through e-commerce, which makes them only available to users who have internet access, a bank account or UPI payment capability, and the ability to have products delivered to an address that has accessibility. None of these conditions can be assumed in the rural study sites.

Thus, to facilitate rural access to cups, they must be incorporated into government procurement (Jan Aushadhi, stocks in primary health centres).

Study Limitations

- The fact that the research took place solely in Maharashtra makes its results only partially applicable to other states that differ culturally, linguistically and economically.
- Although there were 200 respondents in this study, large enough to allow for descriptive and comparative analyses at an adequate level of detail, it was not possible to perform subgroup analysis with enough power due to the limited sample size.
- The use of self-reporting by participants about menstrual practices can underestimate socially undesirable behaviours.

- The research did not sample any male members of the household because many men in households will influence the purchasing decision of menstrual products.

IX. CONCLUSION

This research aimed to examine whether or not the menstrual cup could be a sustainable method to address the problems associated with managing menstruation in India, at both national and community levels (specifically in urban and rural areas of Maharashtra). The findings of this study suggest that, as long as certain facilitating conditions exist, this entire body of evidence indicates that, yes, menstrual cups can be the answer to those questions.

The evidence supporting menstrual cups includes data from many reputable scientific sources, including articles appearing in *The Lancet*, *BMC Public Health*, *BMJ Open*, as well as Google Scholar-indexed literature and other peer-reviewed journals. Evidence from each of the 20 female participants currently using menstrual cups also supported their use as safe, effective, cost-effective and ecologically responsible compared to disposable sanitary products.

The main obstacle is not the item itself, but rather the route taken to attain the item. Many rural female residents within Nandurbar - and the vast majority of other female citizens living in similar situations throughout India - cannot find the cup in various aspects of their lives. The cup is not available on a commercial level (the product cannot be found within market stores in Nandurbar). Secondly, on the informational level, the vast majority of females in this area will have no idea what a menstrual cup is, since they likely would have never heard of them. Lastly, on a cultural level, women's relationship with their own bodies and menstruation has been affected by societal constraints of shame and humiliation; therefore, self-inserted devices, like menstrual cups, would not have a welcoming place in these cultures.

In order to eliminate the existing gaps/return on the investment associated with them, this effort will require simultaneous action on all three fronts. This would involve providing the cup directly to government healthcare facilities; empowering community-based healthcare workers to help demonstrate and promote the product; and sensitising the local communities (particularly the males) with respect to the myths and cultural paradigms surrounding menstruation, in order to instil true empowerment into these women.

With this result, it is possible to accomplish this within a short period; by providing women with respectful,

truthful information about themselves and the product they were going to use, we were able to have an impact on rural women's willingness to adopt the menstrual cup by 20 points in a single demonstration over a period of 13 minutes. Menstrual cups represent far more than just a sanitation product; when put into the right hands, at the right time, with the proper discussion surrounding their use, they are practical tools for improving women's health, economic independence and environmentally friendly behaviour within our communities.

X. SUGGESTIONS AND RECOMMENDATIONS

Policy Level

1. Make menstrual cups part of the essential health commodity list and assure availability at all Jan Aushadhi Kendras, Primary Health Centres (PHCs) and Community Health Centres (CHCs).
2. Extend GST exemption (currently 0% on sanitary napkins) to menstrual cups to eliminate the unjust 12% tax on the more sustainable menstrual product.
3. Incorporate menstrual cup awareness and demonstration within the National Adolescent Health Programme (Rashtriya Kishor Swasthya Karyakram - RKSK) as well as the Menstrual Hygiene Scheme (MHS) operational guidelines.
4. Commission multi-state, national follow-up studies to assess adoption outcomes and cost-effectiveness of subsidised cup distribution compared to disposable pad distribution programs.

Community Health and Outreach

1. Train ASHA workers, Anganwadi workers, and ANMs to conduct structured menstrual cup demonstration sessions —using model cups — in village health and nutrition days (VHNDs), SHG meetings, and school health camps.
2. Develop multilingual (Marathi, Hindi, Tamil, Telugu, Bengali, and other regional languages) IEC materials — posters, illustrated pamphlets, short audio-visual clips — that accurately explain cup use, address common myths, and present the cup as a dignified, practical choice.
3. Establish peer-led menstrual cup discussion groups in schools and colleges, facilitated by trained female teachers or counsellors, to normalize conversation and create supportive peer environments.

Education and Awareness

1. Introduce age-appropriate menstrual anatomy and hygiene education in the secondary school curriculum (Classes 7–9), including discussion of a range of menstrual products, to give adolescent girls the knowledge foundation they need to make informed choices.
2. Partner with women's self-help groups to integrate menstrual cup awareness into existing livelihood and health literacy programs — meeting women where they already gather.

Private Sector and Civil Society

1. Encourage menstrual cup manufacturers to develop affordable entry-level products (INR 150–250) with simple multilingual instruction inserts designed for first-time users with limited prior health literacy.
2. CSR programs of health and FMCG companies should fund rural menstrual cup demonstration camps, subsidised first- cup provision, and follow-up support helplines for new users.

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