

## Original Research Article

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# Knowledge, use and acceptability of menstrual cup: an explorative study among women health professionals in Kerala, India

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## ABSTRACT

**Background:** Globally, despite a long history of invention and safety measures, the menstrual cup is not a widely used method of menstrual management among women. As comprehensive evidence on the menstrual cup use is relatively limited in India, this study aimed to describe the knowledge, use, and acceptability of menstrual cup among women health professionals in Kerala, India.

**Methods:** We conducted a web-based cross-sectional survey among adult menstruating women health professionals. Information on knowledge of menstrual cups, pattern of use and acceptability of menstrual cups, and factors associated with the usage of menstrual cups were collected. Qualitative interviews were also conducted among current, discontinued and non-users of menstrual cup.

**Results:** Of the 346 women studied, the majority (97%) of the participants were acquainted with menstrual cups. Ever use of a menstrual cup was reported by 34.7% of participants. Currently, women mainly used sanitary pads (73%), followed by the menstrual cup (26%) as the main menstrual hygiene product. The quantitative and qualitative analysis showed a high level of acceptability among users of menstrual cups and perceptible restraints among non-users. Environment safety and affordability were the most appealing factors for menstrual cup use.

**Conclusions:** Nearly a fourth of health professionals in the study were currently using the menstrual cup. A high level of overall knowledge and acceptability among the users of the menstrual cup as seen in the study is likely to motivate and enhance better choice of menstrual products among women in general.

**Keywords:** Health professionals, India, Kerala, Menstrual cup

## INTRODUCTION

Menstruation is a natural fact of life and a monthly occurrence for the 1.8 billion women in the world.<sup>1</sup> Globally, women choose different options for menstrual management according to the availability of menstrual hygiene products, personal choice, socio-economic conditions, traditional and cultural practices.<sup>2</sup> Subtly the

discourse of menstrual hygiene management based on hygienic menstrual management methods switched to the categorization of cost-effective, eco-friendly, and culturally appropriate hygiene methods.<sup>2,3</sup> However, mainstreaming of environmental protection into the dominant development agenda shifted the preferences to menstrual cups and reusable pads.<sup>4</sup>

A menstrual cup, inserted into the vagina, collects menstrual blood, holding three times more than a sanitary pad and requiring emptying every 6-12 hours.<sup>5</sup> It's reusable, cost-effective, lasting nearly ten years, and significantly reduces menstrual waste.<sup>5</sup> A comparative environmental impact analysis of menstrual products reported that if menstrual cup use sextupled, a waste reduction of 84% would be achieved.<sup>6</sup> This becomes pertinent in the context that many disposable menstrual products turn into secondary microplastics which pose a serious threat to human life.<sup>7</sup>

Globally, the evidence on the use of menstrual cups is limited; not being commonly addressed in menstrual health education. Since the 1960's studies have documented the acceptability and use of menstrual cups in the Global North.<sup>8</sup> The first systematic review and meta-analysis of the international use of menstrual cups identified 199 brands of menstrual cups, availability in 99 countries, and obtained data from 3319 women.<sup>9</sup> This study concluded that menstrual cups were a safe and effective option for menstruation management in high-, middle- and low-income countries.<sup>9</sup>

While the menstrual cup is generally claimed to be safe, associated adverse effects have been documented, mainly limited to local symptoms such as irritation and pain, especially with initial use.<sup>5</sup> Serious adverse effects were not commonly reported with the usage of cups, however, five case reports of toxic shock syndrome associated with menstrual cup were reported in a systematic review and meta-analysis of international studies.<sup>9</sup> A Malawi study observed certain concerns of using menstrual cup such as the need of high-level hygiene, difficulty in finding water in public places, misconceptions of hymen breakage, vaginal laxity and subsequent dissatisfaction during sexual intercourse.<sup>10</sup> Conversely, in an Iranian study, complaints of leakage and difficulty in cup removal were attributed to the lack of training or unfamiliarity with the anatomy of the reproductive organs.<sup>11</sup>

Despite the long history of its invention and safety measures, the menstrual cup is not a widely used method of menstrual management among women in India. Literature shows few studies from India reported on the awareness and usage of menstrual cups.<sup>12-17</sup> In a study done among South Indian gynaecologists in 2019, only 26.5% were found to be aware of menstrual cup.<sup>12</sup> Lack of awareness about menstrual cups was also observed among medical students in Bangalore.<sup>13</sup> India being a conservative country, insertion of a penetrating device into the vagina of a woman is considered disgusting.<sup>15</sup> Moreover, irrespective of educational status there is a notion that inserting a vaginal cup will lead to loss of virginity.<sup>15</sup> However, insertion and removal became easy with subsequent menstrual cycles and comfort level increased with experience in 90% of married women.<sup>16</sup> Thus, acceptance of menstrual cup was found to be higher in sexually active women compared to those who are sexually inactive.<sup>17</sup>

Kerala state in India is renowned for its high health and development indicators, particularly in women's reproductive health.<sup>18</sup> Despite a positive attitude towards menstrual hygiene influenced by widespread education, societal taboos and cultural norms persist impacting menstrual practices.<sup>19</sup> While menstrual cups are emerging in Kerala's reproductive health landscape, their regular use remains limited to a small number of women.<sup>20</sup> There is a lack of context-specific evidence regarding knowledge, awareness, and practices related to menstrual cup usage among women in Kerala. While previous studies have explored certain aspects of menstrual cup use in closed groups and institutional settings, our study aims to provide a comprehensive understanding by including nonusers, users, and discontinued users of menstrual cup. We specifically targeted medical professionals, presuming their greater awareness about menstrual products and that their knowledge and awareness could potentially influence and improve practices among other women. Access to information on the acceptability and awareness of menstrual cup is crucial for informed decision-making and effective menstrual health education for girls and women.

### **Objectives**

The objectives of the present study were to explore the awareness, use and acceptability of menstrual cups among female health professionals in Kerala.

### **METHODS**

A cross-sectional study was conducted among adult menstruating women health professionals in Kerala. A survey link was created using Google forms in English (Google LLC). A brief description about the aim of the survey and details of confidentiality and anonymity of the data were included in the introductory section of the survey. In the beginning, a question on their willingness to participate in the survey was included to get informed consent.

#### ***Study participants and data collection***

The study participants were menstruating women health professionals (18 years and older) residing in Kerala state of India at the time of the survey. The health professionals included medical (doctors, nurses), paramedical and nonmedical staff working in the healthcare setting. The survey was conducted using a pre-structured questionnaire, prepared after reviewing the related literature in print and social media. The study tool was piloted among twenty women health professionals of reproductive age group and relevant feedback was incorporated before the main survey. The questionnaire comprised sections covering sociodemographic information of participants and details related to menstruation, including the materials utilized for menstrual hygiene. The questions to assess knowledge and acceptability related to the menstrual cup was finalised following formative evaluation. Additionally, for menstrual cup users' questions on their experience with

menstrual cups, and acceptability or satisfaction with menstrual cups were included. The participants were asked to rate their acceptability of using menstrual cup in terms of leakage prevention, comfort, convenience, odour-prevention, activity-compatibility, environmental safety, ease of use, maintenance of hygiene and durability of the product using a three-point scale (poor, good and very good). The electronic open survey was circulated using social media platforms including WhatsApp and Email. Efforts were made to circulate the survey within the circle of the researchers with a request to circulate the survey form to their contacts. The survey was open from 10 to 30 November 2022.

Based on the pilot survey finding of 30% ever menstrual cup users, with an absolute precision of 5% for the 95% confidence interval, the sample size was estimated as 323, which was rounded off to 330. We presented the study according to the checklist for reporting results of internet e-surveys guidelines.<sup>21</sup>

#### Statistical analysis

The data collected through google forms were coded and entered into the Microsoft excel worksheet. Data editing and analysis were performed using STATA SE 17, Texas USA. Using descriptive statistics, basic characteristics were presented in frequencies and percentages. The prevalence and 95% confidence intervals for the use of menstrual cups were estimated. Associations were tested using Pearson Chi-squared test/Fishers test. A p value of  $\leq 0.05$  was considered statistically significant.

Fifteen semi-structured interviews were also conducted with a mix of identified menstrual cup users, non-users and discontinued menstrual cup users. Objectives of qualitative interviews were to elaborate and further explore the findings from the quantitative survey. We interviewed menstrual cup users to find out their experience of benefits and difficulties of using the cup and adaptability of menstrual cup in managing menstrual hygiene practices. We also interviewed previous menstrual cup users to find out their positive and negative experiences while using the cup as well as circumstances that led to discontinue using the cup. The notions of non-users were also sought for to understand the factors that restricted them from using menstrual cup. Participants in the qualitative phase were recruited through purposive sampling. The data was analysed using qualitative content analysis.

#### RESULTS

##### Baseline characteristics of study participants

A total of 346 women health professionals, working in different areas of health care participated in the study. The background characteristics of these women menstruators are presented in Table 1. The mean age of participants was 30 years ( $SD \pm 5.7$ , ranging from 19 to 50 years). Nearly 44 % of participants had post-graduation or above level of

education. About ten percent of participants were educated in modern medicine, 25% in nursing, 24% in Ayurveda, Yoga and Naturopathy, Unani, Siddha and Homeopathy (AYUSH) systems of medicine and the remaining were in dentistry, pharmacy, paramedical and others. About 54% were employed, 31% were students and the remaining were not working at the time of the survey. The average age at menarche was reported as 13 years ( $SD \pm 1.3$ ). Nearly 71% of women were ever married. Among the currently married women, 36% were using any family planning method.

**Table 1: Background characteristics of study participants (n=346).**

Characteristics	Frequency	%
<b>Age (mean, SD, minimum-maximum)</b>	30.1, 5.7, 19-50	
<b>Highest level of educational qualification</b>		
Diploma/degree	194	56.1
Post-graduation or above	152	43.9
<b>Area of education</b>		
Modern medicine	34	9.8
AYUSH	84	24.3
Dentistry	55	15.9
Nursing	88	25.4
Pharmacy/paramedical	18	5.2
Others	67	19.4
<b>Occupational status</b>		
Employed	187	54.1
Student	106	30.6
Unemployed	53	15.3
<b>Area of work</b>		
Clinical	158	45.7
Research/academics	96	27.8
Non-clinical/others	40	11.6
Not working	52	15.0
<b>Age at menarche (mean, SD, minimum-maximum)</b>	12.9, 1.3, 8-18	
<b>Ever married</b>	246	71.1
<b>Type of delivery (for those who had children, N=174)</b>		
Normal	71	40.8
Caesarean	97	55.7
Both	3	1.7
<b>Underwent sterilization (for those who had children, N=174)</b>	32	18.4

##### Menstruation and menstrual hygiene management

Details regarding menstruation and the materials used for menstrual hygiene management are presented in Table 2. The majority (93%) of the participants had a regular period between 21 to 35 days. Around 65% reported that menstrual bleeding usually lasts for 4 to 6 days. Women

mostly used sanitary pads (73%) and about 26% reported they are currently using menstrual cup as their main menstrual hygiene product. More than three fourth of the participants (78%) were satisfied with the current menstrual hygiene method used.

**Table 2: Details of menstruation and the materials used for menstrual hygiene management (n=346).**

Details of menstruation	Freque- ncy	%
<b>Experienced regular periods (between 21-35 days)</b>	323	93.35
<b>Days of bleeding in a usual menstrual cycle</b>		
1-3	104	30.06
4-6	223	64.45
More than 7	19	5.49
<b>Type of menstrual blood flow</b>		
Low to moderate	294	15.02
Heavy	52	84.97
<b>Frequency of changing menstrual material on the heaviest days of periods (times)</b>		
1-2	65	18.79
2-4	230	66.47
>4	51	14.74
<b>Materials used for menstrual hygiene management</b>		
<b>Currently used main menstrual hygiene product</b>		
Menstrual cups	89	25.72
Sanitary pads	253	73.12
Cloth/cloth pad	4	1.16
Satisfied with the current menstrual hygiene method or product	271	78.32

#### **Knowledge about menstrual cups**

Among the total participants, about 337 (97.4%) had heard of menstrual cups. General awareness and knowledge about menstrual cup usage of these 337 participants are presented in Table 3. In general, women know how menstrual cup works and where it is positioned. The knowledge regarding the use of menstrual cup while urinating, defecating, swimming and bathing were low among never users. The never-users were more concerned about whether menstrual cup could be used as a contraceptive method and whether it would get stuck inside the vagina. The awareness regarding sterilization and storage of the menstrual cup was also low among non-users.

#### **Experiences with menstrual cups**

There were 117 (34.7%) ever users of menstrual cup in the study. The details of their experiences with menstrual cup use are described in Table 4. More than half of the ever users were influenced by their peers and family members in choosing menstrual cup. About 32% of users had been using the cup for more than a year. More than half of them

got used to the cup by two cycles. Nearly, 90% boiled the cup on the first and last day of their periods. Breathable cotton pouch was the main method of storage in between cycles (79%). About 77% of ever users admitted that they experienced leakage occasionally while using menstrual cup. They attributed the reasons for leakage as using incorrect size of cup, improper method of insertion, cup incompletely unfolded and therefore not positioned well inside the vagina as well as clogging of holes along the rim of the cup. Some were concerned that their bowel movements were causing leakage. Mostly women experienced leakage while using menstrual cup on their heavy flow days during periods. About 49% kept sanitary pads along with menstrual cup owing to fear of leakage. About 31% had ever replaced their used menstrual cup owing to different concerns like incorrect size of cup, leakage and worn out of the cup. About one fourth of the users discontinued using their cup (28%) in between. The attributed reasons were leakage, discomfort while using the cup, messy dealing with own menstrual fluid and loss of the cup. However, majority of the ever users (90%) were ready to recommend menstrual cup to others.

Some side effects were also reported by the users. Nearly 15% of women had vaginal irritation or itching or pelvic pain during or after the use of menstrual cup. Nearly seven percent felt dryness, four percent got urinary tract infection and eight percent sustained vaginal injuries or rashes. About 13% experienced burning sensation and only less than ten percent of women reported any other side-effects.

#### **Acceptability and satisfaction with menstrual cups**

Data on the acceptability and satisfaction with menstrual cups among the users were analyzed. Women in general were satisfied with menstrual cup use. Environmental safety was highly accepted, and users were highly satisfied with its affordability, odour prevention, comfort, convenience, durability, and activity compatibility. While 89% of women were satisfied with the ease of use and 95% of women were satisfied with leakage prevention (Table 5). Among the never users, 54.1% reported that they were willing to try the menstrual cup in future if it is available to them.

#### **Factors associated with the use of menstrual cup**

The factors associated with the use of menstrual cup is detailed in Table 6.

Nearly half of the participants with modern medicine backgrounds ever used a menstrual cup. Among the participants who worked in a clinical setting, 34% ever used menstrual cup, the similar percent for others was 35%. Also, about half of those who had undergone sterilization, ever used menstrual cup while the use was reported by 35 % of women in the other group who were not sterilised. We found a significant association of age with the use of menstrual cup (Figure 1).

**Table 3: Participants' knowledge related to menstrual cups (n=337).**

Knowledge on menstrual cup use	All (n=337)	Ever users (n=117)	Never users (n=220)	P value*
	N (%)	N (%)	N (%)	
<b>Menstrual cup works by collecting and holding blood</b>	327 (97.03)	116 (99.15)	211 (95.91)	0.174
<b>Menstrual cup is positioned inside the vagina</b>	310 (91.99)	114 (97.44)	196 (89.09)	0.006
<b>Menstrual cup can be used by unmarried girls</b>	277 (82.19)	104 (88.89)	173 (78.64)	0.024
<b>It is possible to urinate with the menstrual cup in place</b>	271 (80.42)	113 (96.58)	158 (71.82)	<0.001
<b>It is possible to defecate with the menstrual cup in place</b>	241 (71.51)	100 (85.47)	141 (64.09)	<0.001
<b>Menstrual cup can be used while swimming</b>	257 (76.26)	114 (97.44)	143 (65.00)	<0.001
<b>Menstrual cup can be used while bathing</b>	273 (81.01)	116 (99.15)	157 (71.36)	<0.001
<b>Menstrual cup cannot be used as a method of contraception</b>	236 (70.03)	93 (79.49)	143 (65.00)	0.006
<b>The blood collected in menstrual cup will not flow back to uterus</b>	293 (86.94)	103 (88.03)	190 (86.36)	0.736
<b>Menstrual cup cannot get stuck inside vagina</b>	227 (67.36)	94 (80.34)	133 (60.45)	<0.001
<b>Menstrual cup with same size will not work for everyone</b>	250 (74.18)	105 (89.74)	145 (65.91)	<0.001

\*Significance between ever and never users of menstrual cup

**Table 4: Menstrual cup practices of ever users (n=117).**

Practices	Frequency	Percentage
<b>Duration of use (years)</b>		
<1	68	58.12
1-3	38	32.48
More than 3	11	9.4
<b>Number of cycles took to get used with the menstrual cup</b>		
One to two cycles	69	58.98
Three or more cycles	37	31.62
Not yet	11	9.4
<b>Duration of emptying menstrual cup on a day with heavy flow (hours)</b>		
<2	15	12.82
2-4	36	30.77
4-6	37	31.62
More than 6	29	24.78
<b>Duration of emptying menstrual cup on a day with normal flow (hours)</b>		
<2	9	7.69
2-4	16	13.68
4-6	33	28.21
More than 6	59	50.43
<b>Participants boil menstrual cup before use on the first day of period</b>	103	88.03
<b>Participants boil menstrual cup after periods</b>	102	87.18
<b>Participants boil menstrual cup in between the days of periods</b>	22	18.8
<b>Sanitize/washing hands with soap before inserting the menstrual cup</b>	110	94.02
<b>Sanitize/washing hands with soap after removing the menstrual cup</b>	114	97.44
<b>Participants using breathable cotton pouch to store menstrual cups between menstrual cycles</b>	93	79.49
<b>Ever experienced leakage of menstrual cup</b>	90	76.92
<b>Kept sanitary napkins or cloth along with menstrual cups for fear of leakage</b>	57	48.7
<b>Ever replaced menstrual cup</b>	36	30.77
<b>Discontinued menstrual cup use anytime</b>	33	28.21
<b>Participants ready to recommend menstrual cup to others</b>	105	89.74

**Table 5: Acceptability of menstrual cups among ever users (n=117).**

Acceptability for	Poor, N (%)	Good, N (%)	Very good, N (%)
<b>Leakage prevention</b>	6 (5.13)	47 (40.17)	64 (54.7)
<b>Comfort</b>	7 (5.98)	20 (17.09)	90 (76.92)
<b>Convenience</b>	9 (7.69)	21 (17.95)	87 (74.36)
<b>Odour prevention</b>	1 (0.85)	21 (17.95)	95 (81.2)
<b>Activity compatibility</b>	8 (6.84)	18 (15.38)	91 (77.78)
<b>Environmental safety</b>	0 (0.00)	9 (7.69)	108 (92.31)
<b>Affordability</b>	0 (0.00)	20 (17.09)	97 (82.91)
<b>Ease of use</b>	13 (11.11)	30 (25.64)	74 (63.25)
<b>Maintain hygiene</b>	1 (0.85)	30 (25.64)	86 (73.5)
<b>Durability</b>	1 (0.85)	26 (22.22)	90 (76.92)

**Table 6: Women's characteristics and menstrual cup use.**

Characteristics	Total	Menstrual cup use		P value*
		Ever used, N (%)	Never used, N (%)	
<b>All women</b>	337	117 (34.72)	220 (65.28)	NA
<b>Age group (years)</b>				
<30	182	51 (28.02)	131 (71.98)	
30+	155	66 (42.58)	89 (57.41)	0.01
<b>Education level</b>				
Undergraduate diploma/degree	185	59 (31.89)	126 (68.11)	
Post-graduation or above	152	58 (38.16)	94 (61.84)	0.22
<b>Area of education</b>				
Modern Medicine/Dentistry	88	36 (40.9)	52 (59.09)	
Nursing/Pharmacy/Paramedical	102	31 (30.4)	71 (69.60)	
AYUSH	82	23 (28.1)	59 (71.95)	
Others	65	27 (41.5)	38 (58.46)	
<b>Occupational status</b>				
Employed	184	73 (39.67)	111 (60.32)	
Student	102	27 (26.47)	75 (73.53)	0.07
Presently not working/others	51	17 (33.33)	34 (66.67)	
<b>Area of work</b>				
Clinical	152	51 (33.55)	101 (66.44)	
Non-clinical	185	66 (35.67)	119 (64.32)	0.16
<b>Religion</b>				
Hindu	200	68 (34.00)	132 (66.00)	
Muslim	53	23 (43.40)	30 (56.60)	
Christian	65	19 (29.23)	46 (70.77)	0.43
Others/not want to specify	19	7 (36.84)	12 (63.16)	
<b>Marital status</b>				
Never married	99	30 (30.3)	69 (69.70)	
Others	238	87 (36.55)	151 (63.44)	0.27

NA: Not applicable, \*significance between ever and never users

**Findings from the qualitative interviews**

Semi-structured interviews were conducted among identified menstrual cup users, non-users and discontinued users to explore their experiences.

**Current users of menstrual cup**

Women transitioning from sanitary pads to menstrual cups had concerns about previous products due to issues like

rashes and difficulties with changing and disposal during long work hours. Initially, they faced apprehensions and confusion regarding cup size, insertion, seating, and removal, but with experience, these concerns decreased after three or four cycles.

One unmarried user aged 28 years responded "I am very comfortable with menstrual cup after using it for two to three cycles. Many of my friends used menstrual cup and they motivated me to use it as they found it very

acceptable. Once I started using menstrual cup period days felt like any other day, it gave me more freedom and happiness". I could use the cup for six to eight hours with no leakage. Moreover, it reduced the money spent on sanitary pads."

Another user 30 years old and currently married commented "As I was suffering from rashes and allergy from sanitary pads I shifted to menstrual cup. Initially insertion and removal seemed a daunting task. There was fear of leakage too. So initially I kept pads along with the cup. But once I settled on a correct cup size the whole process seemed effortless and it made my life at ease."



**Figure 1: Prevalence and 95% confidence interval for prevalence of menstrual cup use by age.**

#### *Previous users who discontinued using the menstrual cup*

Participants who stopped using menstrual cups found insertion, removal, and sterilization challenging during emergencies and experienced discomfort and pain. They preferred sanitary pads due to ease of use and found it inconvenient to use menstrual cups with intrauterine devices (IUDs), leading some married users to discontinue cup use.

An unmarried participant aged 27 years commented "I tried menstrual cup for three cycles. I could not insert and remove the cup comfortably. I felt pain and discomfort too. So, I shifted back to my usual pads." A married participant aged forty years said "I used menstrual cup for a few months. But the whole process was not comfortable for me. One thing I could say is pads are more user friendly and easy to use, and we can easily fix it whenever there is an emergency need of a menstrual product". A 26-year-old married participant commented "My IUD got dislodged after using menstrual cup and hence totally gave up the idea of using menstrual cup."

#### *Non-users of menstrual cup*

Being health professionals, most of the participants were well aware of menstrual cup and its attributes. However, a

large proportion of them were reluctant to use menstrual cups for reasons they perceived to negatively affect them.

As one unmarried non-user revealed that "I am aware of the benefits and usage of menstrual cup, many of my friends are also using it, but being unmarried I am concerned about its usage. I am worried about inserting 'something' into the vagina as I fear it might break the hymen. I am also concerned about issues like uterine prolapse and reproductive harm. As I am comfortable with sanitary pads, I don't want to tense myself with using menstrual cup".

Another married non-user commented "Sanitary pads are so comfortable for me. As my work involves frequent travel, difficulty in finding clean water and hygienic toilets with adequate privacy keep me away from using menstrual cup. Sterilising the cup, inserting, removing and cleaning are not that easy when we are in public places. If we are not careful about sterilisation there is high chance of catching infections too."

The above quotes indicate that perceptions about menstrual cup use vary considerably across users and non-users.

## DISCUSSION

Women professionals working in different areas of healthcare sector participated in our study. The participants in our study mostly used sanitary pads, similar to other Indian studies where women primarily used sanitary napkins as the main menstrual hygiene product.<sup>14</sup> In the present survey majority of the participants had heard of menstrual cups and 34.7% were ever users. About 26% reported they are currently using menstrual cup as their main menstrual hygiene product. This is high when compared with studies done elsewhere in India.<sup>13,14</sup> In a study done among women working in a medical institutional setting in South India, 82% were aware about menstrual cup but only 2.6% used it, with the low acceptance attributed to virginity issues as most of the participants were unmarried.<sup>14</sup> However, ever use of menstrual cup was reported by 30% of unmarried and 37% of married women in our study. Concurrently, in a study done among menstrual cup users in Kerala, majority of the users were married and sexually active indicating a higher prevalence of its use among married women.<sup>22</sup>

In our study the general awareness about menstrual cup was high when compared to previous studies done in similar settings.<sup>12,13</sup> However, the concerns associated with using menstrual cup were found to be higher among nonusers. Furthermore, interestingly 35% of non-users and 20% of users were not sure on the fact that menstrual cup cannot be used as a method of contraception. This indicates that the knowledge of the study participants in certain critical areas is contrary to reality.

Majority of women in our study used and were comfortable with sanitary pads. Being health professionals most of the

participants were well aware of menstrual cup and its attributes. The participants perceived menstrual cup use improved their work participation, social activities and was economically beneficial. Yet, certain individuals hesitated to embrace menstrual cups due to concerns such as perceived impacts on virginity and reproductive health, especially among unmarried women. Difficulty in availability of clean water, hygienic toilets, and difficulty in sterilisation while travelling and perceived infection risk in absence of adequate sterilisation, privacy and availability issues were other restraints. However, majority of the ever users were ready to recommend menstrual cup to others as in another study done in Kerala.<sup>22</sup>

Difficulty in earlier cycles and comfort in subsequent cycles is a general trend in menstrual cup usage as being reported.<sup>16,22</sup> The adoption of a menstrual cup definitely requires a familiarisation phase and peer support seemed to be critical for adapting to it.<sup>9</sup> Over half of the menstrual cup users in our study were influenced by peers and family members, with the majority acclimating within two cycles, while a minority required three or more. In our study, 32% of users have been consistently using the menstrual cup for over a year, prompted by issues with their previous menstrual products such as rashes, allergies, and disposal challenges. Initially, users faced confusion with cup size, insertion, seating, and removal, but familiarity improved after three or four cycles, although some replaced their cups due to size, leakage, or wear issues.

Side effects like vaginal irritation, itching, pelvic pain, dryness, urinary tract infection, rashes, burning sensation and vaginal injuries were reported by only a few menstrual cup users in our survey. Similarly, in a study done in Gujarat, a few menstrual cup users reported side effects like rashes, dryness or infection.<sup>16</sup> However, in a study done in Kerala similar symptoms significantly reduced after usage of cups when compared with previously used menstrual products.<sup>22</sup> A study among Kenyan school girls also found menstrual cups to be safe as the established users showed less incidence of bacterial vaginosis and sexually transmitted infections.<sup>3</sup> In a systemic review, even when incidental case reports of vaginal damage, toxic shock syndrome, urinary tract complaints and difficulty retrieving the menstrual cup were reported, infection risk did not appear to increase with use of a menstrual cup.<sup>9</sup> However, it might be hard for novice menstrual cup users to differentiate between pathology and discomfort as part of the normal learning curve.<sup>9</sup>

About a quarter of previous users stopped using the menstrual cup, citing reasons such as leakage, discomfort, messy handling of menstrual fluid, and cup loss. Those who discontinued found insertion, removal, and sterilization challenging, especially during emergencies, and preferred sanitary pads for ease of use, particularly in workplace settings. Married participants expressed concerns about using the cup alongside intrauterine devices (IUDs). Women with intrauterine devices (IUDs) may need to explore alternative options for family

planning or managing menstrual flow, as the compatibility of using a menstrual cup alongside an IUD remains uncertain.<sup>9</sup>

Majority of users in our study reported the overall experience of cup usage as excellent similar to other studies done among menstrual cup users.<sup>22</sup> Environmental safety and hygiene was highly accepted and users in our study were highly satisfied with its affordability, odour prevention, comfort, convenience, durability and activity compatibility. Yet, a large proportion of women experienced leakage occasionally while using menstrual cup and therefore nearly half of users kept sanitary pads along with menstrual cup. However, discomfort and leakage were the most important problems reported by the participants in an institutional study done in Kerala in 2022.<sup>23</sup>

Menstrual cup usage was found to be higher in our study as compared to previously reported studies possibly due to increased awareness within the healthcare setting, alongside factors such as age, marital status, sterilization history, peer support, and the growing influence of social media. This heightened adoption is anticipated among healthcare professionals, who can in turn influence other women's menstrual hygiene decisions, highlighting the potential impact within this demographic.

The study has some limitations, including the self-completed data collection method, which reduces interviewer and social desirability biases but leaves room for misinterpretation. Additionally, self-selection bias may have occurred, with participants interested in menstrual cups more likely to respond. Generalizability is limited to health professionals, and electronic data collection may introduce sample selection bias. Furthermore, the evolving landscape of menstrual cup awareness and use suggests that findings may differ over time. Nevertheless, our study contributes to the sparse literature on menstrual cup knowledge, use, and acceptability among Indian health professionals.

## CONCLUSION

This paper evaluated the cognizance of women healthcare professionals in Kerala on menstrual cup as an alternative solution for menstrual hygiene management; determining their knowledge, perceptions, experiences, acceptability, and factors pertaining to its use. Our study indicates that the acceptability of menstrual cup was adequate among its users which support the notion that menstrual cup can be conceived as an alternative choice in menstrual hygiene education campaigns and programs. However, a significant proportion of study participants were nonusers of the menstrual cup due to reasons they perceived to affect them in a more distinct way. It is critical that freedom in choosing menstrual products is every woman's right and experiences with periods can be deeply personal. At present, several government programs are promoting menstrual cup use in the state, which is likely to increase

the use and acceptability of the product in the future. Improving availability, customized awareness programs, usage support along with peer influence can assist women to choose better and sustainable menstrual hygiene products.

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