

Original Research Article

Knowledge, attitude and practice regarding menstrual cup among adolescent girls in Savadatti taluka, Belagavi district, Karnataka

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ABSTRACT

Background: Menstrual hygiene management (MHM) is a vital component of adolescent health. Despite being safe, reusable, and eco-friendly, menstrual cups are underutilized in India due to cultural taboos and lack of awareness. This study assessed the knowledge, attitude, and practices (KAP) regarding menstrual cup use among adolescent girls.

Methods: A community-based cross-sectional study was conducted from January to June 2025 among adolescent girls aged 15–19 years from 10 schools and 5 colleges, selected through multistage random sampling. Data were collected using a pre-tested, semi-structured questionnaire and analysed using descriptive statistics and Chi-square tests.

Results: Among 426 participants, 43.9% were aware of menstrual cups, yet only 21.1% had adequate knowledge and 9.2% reported use. Positive attitudes were observed in 43.7%. Social media and the internet were the most common sources of information (39.6%), followed by family/friends (24.1%), healthcare professionals (18.7%), teachers (10.2%), and advertisements (7.5%). Knowledge was significantly associated with age, residence, and family income ($p < 0.05$), while attitudes correlated with educational status and income. Fear of insertion was a major barrier to use menstrual cups among 60.4% participants. A strong positive association was observed between knowledge and attitude toward menstrual cups ($p < 0.001$).

Conclusions: Although awareness and attitudes toward menstrual cups are improving, actual use remains limited. Strengthening school-based menstrual education and improving access to accurate information are essential to enhance adoption and promote sustainable menstrual hygiene among adolescents.

Keywords: Menstrual hygiene, Menstrual cup, Adolescent girls, Knowledge attitude practice

INTRODUCTION

Menstrual hygiene management (MHM) is an important yet often neglected aspect of adolescent and reproductive health. Disposable sanitary pads and tampons are the most widely used menstrual products globally. They generate non-biodegradable waste leading to both environmental and public health challenges. Menstrual cups, with the lowest ecological footprint compared to single-use pads and tampons, are being used by 49 and 19 billion individuals each year in the European Union (EU) and United States of America (USA), respectively.^{1,2} Despite

these advantages, their adoption worldwide remains limited, due cultural stigma, insertion-related fears, and lack of awareness.²

In India, the burden of menstrual waste is particularly high. Approximately 336 million menstruating women uses more than 12 billion sanitary products annually, most of which are non-biodegradable and may take 500–800 years to decompose.³ Despite the availability of reusable products like menstrual cups, their use is still limited with only 0.3% of Indian women aged 15–24 years are using them.⁴ Cultural taboos, fear of hymen rupture, concerns

about leakage, and inadequate awareness are the major barriers for the use of menstrual cups.^{5,6}

Health implications are equally significant. Inadequate menstrual hygiene practices increase the risk of reproductive tract infections, absenteeism from school, and psychosocial stress among adolescent girls.⁷ However, the use of sustainable products like menstrual cups if introduced at an early age, can be easier to accept and lead to long-term hygiene practices, while also reducing the associated stigma and offering economic and environmental benefits. Yet existing evidence from India shows that awareness of menstrual cups is moderate to high in some populations, but actual adoption remains consistently low.⁸⁻¹⁰ Studies from both urban and semi-urban contexts report barriers such as lack of practical guidance, concerns over safety, and socio-cultural resistance.⁹⁻¹¹

The unique socio-cultural setting of Savadatti taluka, Karnataka with a mix of rural and urban communities, presents certain challenges for menstrual hygiene promotion. Several factors such as low awareness, cultural norms, resource constraints, and infrastructural barriers may affect the adolescent girls' perceptions and practices around menstrual cups. However, there is limited evidence from this region. Therefore, understanding the knowledge, attitude and practices (KAP) of adolescent girls in this setting is essential to: identify gaps and misconceptions, design culturally appropriate education and awareness interventions, and to inform policies to promote sustainable menstrual hygiene. Hence, this study was conducted to assess the KAP regarding menstrual cups among adolescent girls in Savadatti taluka, Belagavi district, Karnataka.

METHODS

This was a community-based cross-sectional study conducted among adolescent girls aged 15–19 years in Savadatti taluka, Belagavi district, Karnataka. Data collection was carried out between January and June 2025.

A total of 10 schools and 5 colleges were selected by random sampling. Within each institution, participants were chosen through simple random sampling. Permission was obtained from the respective headmasters and principals before initiation of the study. The objectives of the study were explained in the local language, and informed consent/assent was obtained from all participants. For minors, parental consent signatures were also collected. Confidentiality and anonymity were maintained throughout the study.

Data were collected using a semi-structured, pre-tested questionnaire administered in classroom settings. The tool collected demographic characteristics, as well as knowledge, attitudes, and practices related to menstrual cups. Students were seated separately during administration, and the process was supervised by both

teachers and the investigator. Each questionnaire required approximately 20–25 minutes to complete.

The primary outcomes were levels of KAP regarding menstrual cups. Secondary analyses examined associations between KAP scores and socio-demographic variables.

The study was approved by the Institutional Ethics Committee (IEC) of Manipal Academy of Higher Education (MAHE) and the Block Educational Officer in Savadatti Block, Karnataka.

Statistical analysis

Data were entered in Microsoft Excel and analysed using Jamovi software (version 2.4.6). Categorical variables were summarized as frequencies and percentages. Associations between socio-demographic variables and KAP categories were tested using the Chi-square test or Fisher's exact test, as appropriate. A two-sided p value of <0.05 was considered as statistically significant.

RESULTS

Sociodemographic characteristics

A total of 426 adolescent girls participated in the study. The majority (89.0%, n=380) were aged 15–17 years, with only 10.8% (n=46) in the 18–19-year group. More than half (56.8%, n=242) were from rural areas, while 43.2% (n=184) resided in urban areas. Most were school-going students (72.1%, n=307), and a smaller proportion were in pre-university education (27.9%, n=119).

The majority of families had an annual income <50,000 Indian Rupees (INR) (92.0%, n=392). Nearly half of mothers (50.5%, n=215) had completed secondary school leaving certificate/pre-university course (SSLC/PUC), while 46.0% (n=196) were below SSLC. Fathers showed slightly higher education levels, with 23.0% (n=98) being graduates. Homemaking (28.9%) and garment/tailoring (34.3%) were the most common occupations among mothers, whereas farming (23.2%) and business (20.2%) predominated among fathers (Table 1).

Awareness and sources of information

Among the 426 participants, only 43.9% (n=187) were aware of menstrual cups, while 56.1% (n=239) had no prior knowledge (Figure 1). Among those who were aware, the internet and social media were the primary source of information (39.6%, n=74), followed by family and friends (24.1%, n=45), healthcare professionals (18.7%, n=35), schools/teachers (10.2%, n=19), and advertisements (7.5%, n=14) (Figure 2).

Knowledge, attitudes, and practices

Only 21.1% (n=90) of participants had adequate knowledge about menstrual cups, while the majority

(78.9%, n=336) had inadequate knowledge. Attitudes were similarly limited, with 43.7% (n=186) showing a positive attitude and 56.3% (n=240) expressing poor attitudes. Practices were least encouraging, as only 9.2% (n=39) reported good practices, while 90.8% (n=387) had poor practices (Table 2).

Table 1: Sociodemographic profile of study participants (n=426).

Variables	Category	N	%
Age (years)	15–17	380	89.2
	18–19	46	10.8
Residence	Urban	184	43.2
	Rural	242	56.8
Education level	High school	307	72.1
	Pre-university	119	27.9
Family income (INR)	<50,000	392	92.0
	50,000–100,000	8	1.9
	>100,000	26	6.1
Mother's education	Below SSLC	196	46.0
	SSLC/PUC	215	50.5
	Graduation and above	15	3.5
Father's education	Below SSLC	214	50.2
	PUC	114	26.8
	Graduation and above	98	23.0
Mother's occupation	Homemaker	123	28.9
	Garment/tailor	146	34.3
	Farmer/daily wage	110	25.8
	Teacher/vendor/others	47	11.0
Father's occupation	Farmer	99	23.2
	Business	86	20.2
	Driver/electrician	98	23.1
	Teacher/engineer	84	19.7
	Daily wage/tailor	59	13.8

INR: Indian rupees; KAP: knowledge attitude and practice; PUC: pre-university course; SSLC: secondary school leaving certificate

Table 2: Distribution of knowledge, attitude, and practice regarding menstrual cups (n=426).

Variables	Category	N	%
Knowledge	Adequate	90	21.1
	Inadequate	336	78.9
Attitude	Good	186	43.7
	Poor	240	56.3
Practice	Good	39	9.2
	Poor	387	90.8

Detailed analysis of knowledge items showed that while about half of participants correctly identified silicone as the cup material, many believed it was plastic or leather. Misconceptions regarding duration of use were common, with several respondents believing the cup could only be used once or for a few months. Internet and social media were the major information sources (Table 3).

Item-wise responses on attitude found that most girls agreed that menstrual cups are hygienic, modern, and cost-effective, and nearly 80% would recommend them to peers. However, concerns about safety, ease of use, and the possibility of infection were present (Table 4).

Practice-related findings showed very low adoption. Among the few current users, most had been using the cup for less than one year. While many participants acknowledged the menstrual cup's safety and cost-effectiveness, several expressed concerns regarding its comfort, possible interference with daily activities, and a lack of confidence in using it correctly. Among non-users, a considerable number were still uncertain about whether they would be willing to try it in the future (Table 5).

Determinants of knowledge

Logistic regression analysis found that age, residence, and family income were significantly associated with knowledge levels. Participants aged 18–19 years were less likely to have adequate knowledge compared to those aged 15–17 years (adjusted odds ratio [AOR]=0.34; 95% confidence interval [CI]: 0.14–0.83; $p=0.069$). Rural participants were more likely to have adequate knowledge than their urban ones (AOR=1.71; 95% CI: 0.86–3.41; $p<0.001$). Family income also influenced knowledge with participants from families earning >50,000 INR annually were less likely to have adequate knowledge (AOR=0.23; 95% CI: 0.04–0.88; $p=0.032$) (Table 6).

Determinants of attitude

Educational status and family income were the significant predictors of attitudes toward menstrual cups. Pre-university students were less likely to show a positive attitude compared to high school students (AOR=0.44; 95% CI: 0.28–0.68; $p<0.001$). Similarly, participants from families with an annual income >50,000 INR were significantly less likely to have a positive attitude (AOR=0.11; 95% CI: 0.04–0.32; $p<0.001$). No significant association was observed with age, residence, or parental education (Table 7).

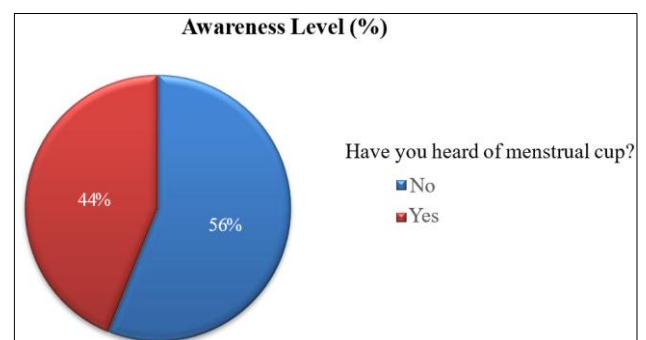


Figure 1: Awareness of menstrual cups among adolescent girls.

Table 3: Distribution of knowledge regarding menstrual cups (n=187).

Variables	Category	Frequency (N)	Percentage (%)
Material used	Leather	27	14.4
	Plastic	63	33.7
	Silicon	97	51.9
Shape the menstrual cup	Bell shape	137	73.3
	Round shape	38	20.3
	Square shape	12	6.4
Size of menstrual cups	All sizes	125	66.8
	Always customize	32	17.1
	Only free size	30	16.0
Average cost	100-150 Rs.	45	24.1
	100-150 Rs.	90	48.1
	More than 200 Rs.	52	27.8
Source of information	Advertisement	14	7.5
	Family/friends	45	24.1
	Healthcare professionals	35	18.7
	Internet/social media	74	39.6
	School/teacher	19	10.2
Usage duration (hours)	12	34	18.2
	3	59	31.6
	6	94	50.3
Sterilization method	Boiling for 5-10 minutes	112	59.9
	Dry heating for 25-30 minutes	50	26.7
	Radiation for 45-50 minutes	25	13.4
Reusable duration	3-10 years	58	31.0
	4-8 months	95	50.8
	Only once	34	18.2
The major advantage	Easily available	106	56.7
	Easy to use	65	34.8
	Environment friendly	16	8.6

Table 4: Distribution of attitude regarding menstrual cups (n=187).

Variables	Strongly agree, N (%)	Agree, N (%)	Neither agree nor disagree, N (%)	Disagree, N (%)	Strongly disagree, N (%)	Total, N (%)
Hygienic option	59 (31.6)	100 (53.5)	23 (12.3)	2 (1.1)	3 (1.6)	187 (100)
Morden method	43 (23.1)	77 (41.4)	48 (25.8)	16 (8.6)	2 (1.1)	187 (100)
Recommendations to other	53 (28.3)	96 (51.3)	26 (13.9)	8 (4.3)	4 (2.1)	187 (100)
Cost-effective	60 (32.1)	78 (41.7)	30 (16.0)	17 (9.1)	2 (1.1)	187 (100)
User-friendly	60 (32.1)	72 (38.5)	37 (19.8)	14 (7.5)	4 (2.1)	187 (100)
Environmentally friendly	66 (35.3)	66 (35.3)	37 (19.8)	14(7.5)	4 (2.1)	187 (100)
Schools' education	93 (49.7)	72 (38.5)	16 (8.6)	4 (2.1)	2 (1.1)	187 (100)
Open to discussion	76 (40.9)	75 (40.3)	26 (14.0)	7 (3.8)	2 (1.1)	187 (100)
Peer influence	16 (8.6)	62 (33.2)	53 (28.3)	46 (24.6)	10 (5.3)	187 (100)
Infection fear	34 (18.2)	40 (21.4)	38 (20.3)	62 (33.2)	13 (7.0)	187 (100)

Table 5: Frequency and percentage of practice regarding menstrual cups.

Variables	Response category	N	%
Duration of use (for current users)	<6 months	10	38.5
	6 months – 1 year	11	42.3
	1–2 years	2	7.7
	>2 years	3	11.5

Continued.

Variables	Response category	N	%
Overall experience with menstrual cup	Very positive	9	17.4
	Neutral	11	47.8
	Very negative	3	13.0
Trust in safety	Strongly agree	61	32.6
	Agree	88	47.1
	Neutral	30	16.0
	Disagree	7	3.7
	Strongly disagree	1	0.6
Long-term economic benefit	Strongly agree	66	35.3
	Agree	83	44.4
	Neutral	26	13.9
	Disagree	10	5.3
	Strongly disagree	2	1.1
Comfort of use	Strongly agree	50	26.7
	Agree	64	34.2
	Neutral	58	31.0
	Disagree	11	5.9
	Strongly disagree	4	2.1
Use as alternative method	Strongly agree	60	32.0
	Agree	58	31.0
	Neutral	52	27.8
	Disagree	13	7.0
	Strongly disagree	4	2.1
Effect on daily activities	Strongly agree	19	10.2
	Agree	43	22.9
	Neutral	68	36.4
	Disagree	48	25.7
	Strongly disagree	9	4.8
Confidence in using	Strongly agree	29	15.5
	Agree	63	33.6
	Neutral	71	37.9
	Disagree	19	10.2
	Strongly disagree	5	2.7
Availability in shops	Strongly agree	55	29.4
	Agree	94	50.2
	Neutral	18	9.6
	Disagree	16	8.6
	Strongly disagree	4	2.1
Comfort while wearing	Strongly agree	53	28.3
	Agree	63	33.6
	Neutral	49	26.2
	Disagree	21	11.2
	Strongly disagree	1	0.5

Table 6: Logistic regression analysis of factors influencing adolescents' knowledge regarding menstrual cups (n=426).

Variables	Adequate knowledge, N (%)	Inadequate knowledge, N (%)	COR (95% CI)	P value	AOR (95% CI)	P value
Age (years)						
15–17	75 (19.7)	305 (80.3)	1	–	1	–
18–19	15 (32.6)	31 (67.4)	0.51 (0.26–0.98)	0.046	0.34 (0.14–0.83)	0.069
Education						
High school	60 (19.5)	247 (80.5)	1	–	–	–

Continued.

Variables	Adequate knowledge, N (%)	Inadequate knowledge, N (%)	COR (95% CI)	P value	AOR (95% CI)	P value
Pre-university	30 (25.2)	89 (74.8)	0.72 (0.43–1.19)	0.200	–	–
Residence						
Urban	57 (31.0)	127 (69.0)	1	–	1	–
Rural	33 (13.6)	209 (86.4)	2.84 (1.75–4.60)	<0.001	1.71 (0.86–3.41)	<0.001
Family income						
<50,000	88 (22.4)	304 (77.6)	1	–	1	–
>50,000	2 (5.9)	32 (94.1)	4.63 (1.09–19.7)	0.038	0.23 (0.04–0.88)	0.032

AOR: Adjusted odds ratio; CI: confidence interval; COR: crude odds ratio; INR: Indian rupees

Table 7: Logistic regression analysis of factors influencing adolescents' attitudes toward menstrual cups (n=426).

Variables	Positive attitude, N (%)	Negative attitude, N (%)	COR (95% CI)	P value	AOR (95% CI)	P value
Age (years)						
15–17	166 (43.7)	214 (56.3)	1	–	–	–
18–19	20 (43.5)	26 (56.5)	1.01 (0.54–1.87)	0.974	–	–
Education						
High school	117 (38.1)	190 (61.9)	1	–	1	–
Pre-university	69 (58.0)	50 (42.0)	0.44 (0.29–0.68)	<0.001	0.44 (0.28–0.68)	<0.001
Residence						
Rural	113 (46.7)	129 (53.3)	1	–	–	–
Urban	73 (39.7)	111 (60.3)	1.33 (0.90–1.96)	0.148	–	–
Family income						
<50,000	157 (40.1)	235 (59.9)	1	–	1	–
>50,000	29 (85.3)	5 (14.7)	0.12 (0.04–0.30)	<0.001	0.11 (0.04–0.32)	<0.001

AOR: Adjusted odds ratio; CI: confidence interval; COR: crude odds ratio; INR: Indian rupees

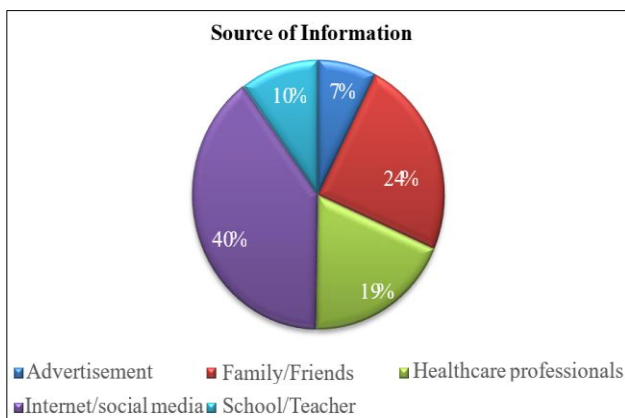


Figure 2: Sources of information on menstrual cups among those aware.

DISCUSSION

This study evaluated the KAP related to menstrual cup use among adolescent girls aged 15–19 years. The findings show that while menstrual cups are increasingly recognized as a sustainable menstrual hygiene option, awareness and actual usage among young girls is limited. Only 43.9% of participants had heard of menstrual cups, and only 9.2% had ever used them. Although many participants expressed willingness to recommend

menstrual cups to others, persistent gaps in knowledge, cultural hesitations, and misconceptions continue to hinder their wider acceptance.

Awareness levels observed in this study were modest compared to some urban studies in India. A study from urban Kerala reported that over 90% of women were aware of menstrual cups, yet only 15% had used them.⁶ Similarly, another study noted that even among healthcare professionals, misconceptions about safety and insertion were common.¹³ In the present study, less than one-fourth of participants showed adequate knowledge, and many had incorrect beliefs regarding the material, cost, and lifespan of menstrual cups. However, previous studies show that medical-grade silicone cups are durable and can safely be reused for up to 10 years when properly maintained.¹⁴

In the present study, social media and the internet are the most common sources of information about menstrual cups, followed by family and peers. This suggests that adolescents tend to rely more on informal digital sources rather than structured health education. Similar observations have been reported in studies from Kerala and Gujarat, where online platforms often replaced formal channels of menstrual health communication.^{15,16} However, certain unregulated sources can also circulate misinformation, reinforcing myths about virginity, pain, and hygiene that strongly influence adolescent

perceptions.¹⁷ The limited involvement of teachers and healthcare providers observed in this study highlights an important opportunity to strengthen school-based and community-level menstrual health education through accurate, evidence-based guidance.

Despite these knowledge gaps, nearly half of the participants in the present study expressed positive attitudes toward menstrual cup use, and a few said they would recommend the product to others. This finding indicates that adolescents are open to adopting sustainable menstrual hygiene options when they receive proper information and reassurance. Similar findings were reported in other studies, where young women showed willingness to try menstrual cups but were held back by fears related to insertion, pain, and infection.^{17,18}

In the current study, attitudes were also influenced by age, education, residence, and family income. Participants from urban areas and better-educated families tended to express more favourable views, consistent with earlier findings that socioeconomic and educational differences play an important role in shaping menstrual health literacy.^{12,16}

Although awareness and attitudes showed encouraging trends, actual menstrual cup use remained extremely low. Less than one in ten participants reported ever using a menstrual cup, reflecting both national and global patterns. According to the National Family Health Survey-5 (NFHS-5) data, less than 0.3% of Indian women aged 15–24 years use menstrual cups.¹⁶ The major barriers identified in this study are fear of insertion, lack of guidance, and cultural discomfort which are similar to those documented in previous studies.^{13,14} While a few users reported positive experiences, several described initial difficulties, emphasizing the need for practical demonstrations, peer support, and continued guidance to improve confidence and comfort during early use.

The present study also demonstrated a strong association between knowledge and attitude, suggesting that better understanding of menstrual cups can lead to more favourable perceptions and greater acceptance. However, translating awareness into actual behaviour requires ongoing engagement, open conversations, and normalization of menstrual cup use within peer and family circles. Evidence from intervention-based studies supports that hands-on demonstrations, peer mentorship, and guided counselling can significantly improve comfort levels and uptake among new users of menstrual cups.¹⁸

These findings highlight the urgent need for structured menstrual health education programs within schools, particularly in rural and semi-urban settings. Integrating menstrual cup awareness and training into existing adolescent health initiatives, such as the Rashtriya Kishor Swasthya Karyakram (RKSK), could help bridge the gap between knowledge and practice. Healthcare providers, teachers, and community educators should be equipped to educate regarding myths, address safety concerns, and

offer practical guidance on the use, hygiene, and maintenance of menstrual cups. Strengthening digital and social media campaigns with credible, evidence-based content can also play a vital role in reshaping perceptions and encouraging informed choices among adolescents.

A major strength of this study lies in its focus on adolescents from both rural and urban areas, which provided a balanced perspective on menstrual hygiene awareness in a semi-urban Indian context. The large sample size added robustness to the observed associations between knowledge, attitudes, and sociodemographic factors. Furthermore, the use of validated KAP tools enhanced the reliability and comparability of results with existing literature.

However, certain limitations should be acknowledged. The cross-sectional design limits the ability to infer causality between variables. Self-reported responses may have been influenced by recall bias or social desirability, particularly given the sensitive nature of menstruation. In addition, as the study was conducted in a single taluka, the findings may not be generalizable to all regions. Future research using mixed-method approaches, including qualitative insights, could provide deeper insights into the cultural beliefs, emotional factors, and social barriers that influence menstrual cup adoption among adolescents.

CONCLUSION

The present study highlights that although awareness and attitudes toward menstrual cups among adolescent girls in Savadatti Taluka are gradually improving, actual adoption remains very limited. There are misconceptions, fear of insertion, and inadequate menstrual health education which continue to act as major barriers. Strengthening school-based menstrual health programs, ensuring access to accurate information through healthcare providers and digital media, and promoting open discussions can help bridge the knowledge–practice gap. These efforts are essential to enhance menstrual hygiene, empower the adolescent girls, and support sustainable health practices.

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