

MENSTRUAL CUP: KNOWLEDGE, AWARENESS, UTILIZATION, AND EFFECTIVENESS OF EDUCATIONAL INTERVENTIONS AMONG ADOLESCENTS AND YOUNG WOMEN

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Abstract: *Background: Menstrual hygiene management is a critical reproductive health challenge affecting millions of adolescents and young women worldwide. The menstrual cup has emerged as a safe, eco-friendly, and cost-effective alternative to conventional products. Despite proven advantages, knowledge, awareness, and utilization remain inadequate, particularly in India, where cultural taboos and lack of structured education persist. Objectives: To synthesize evidence on (1) the level of knowledge, awareness, and utilization of menstrual cups among adolescents, nursing students, and young women; (2) the effectiveness of Structured Teaching Programmes (STP); and (3) factors associated with knowledge levels across eight included studies. Review Methodology: A narrative systematic review was conducted. Eight peer-reviewed studies published 2022–2026, conducted in India and Nepal, were included. Designs ranged from pre-experimental (one group pre-test post-test), cross-sectional, to descriptive observational. Populations included school girls (ages 12–18), nursing students (BSc/GNM), and reproductive-age women (N=853 total participants). Key Findings: Baseline menstrual cup knowledge was poor to moderate across all studies. STP produced statistically significant improvements in knowledge ($p < 0.05$ in all interventional studies). Post-intervention, adequate knowledge levels rose from 0–27% pre-test to 75–100% post-test. Fear of insertion (56.2%) and lack of knowledge (22.6%) were key barriers. Only 15.1% of urban educated women had ever used a cup despite 93.4% awareness. Conclusion: Structured educational interventions are highly effective in improving menstrual cup knowledge. A wide knowledge-to-utilization gap persists and must be addressed through school-based education, healthcare provider training, and policy-level promotion.*

Categories: Women's Health; Adolescent Health; Menstrual Hygiene Management; Nursing Education; Community Medicine

IndexTerms: Menstrual Cup; Knowledge; Awareness; Utilization; Structured Teaching Programme; Adolescents; Menstrual Hygiene; India; PRISMA; Systematic Review

I. INTRODUCTION

Menstruation is a normal biological process marking the onset of a woman's reproductive years. Despite being universal, it remains surrounded by cultural taboos, myths, and stigma — particularly in South Asian societies — contributing to poor menstrual hygiene practices and associated health risks.

Approximately 70% of reproductive tract infections (RTIs) in Indian women are directly attributable to poor menstrual hygiene. India has an estimated 190 million adolescent girls below 19 years. Yet many enter menarche uninformed, compelled by tradition to adopt unhygienic practices.

The menstrual cup — a reusable, bell-shaped device made of medical-grade silicone, rubber, or latex — has emerged globally as a superior alternative. It is inserted into the vagina to collect menstrual fluid, holds 10–38 ml, can be worn for 6–12 hours, and requires simple boiling for sterilization. Benefits include cost-effectiveness, environmental sustainability (India generates ~12.3 billion non-biodegradable pads annually), safety, and reduced leakage.

Despite decades of availability, cup adoption in India remains critically low due to lack of awareness, cultural discomfort, fear of insertion, and absence of structured menstrual health education. National data (NFHS-5, 2019–21) indicates approximately 71% of adolescent girls in India are unaware of menstrual cups.

This systematic review synthesizes evidence from eight recent studies — spanning school girls, nursing students, and reproductive-age women across India and Nepal — to characterize the knowledge gap and evaluate the effectiveness of educational interventions in bridging it.

II. REVIEW METHODOLOGY

This narrative systematic review was conducted using peer-reviewed studies from IJSATE, Cuest. Fisioter., IJSR, IJAR, J Family Reprod Health, J KIST Med Coll, and Journal of Neonatal Surgery.

Search terms: 'menstrual cup', 'menstrual hygiene management', 'knowledge menstrual cup nursing students', 'structured teaching programme menstrual cup', 'menstrual cup awareness adolescents India'.

Inclusion criteria: Peer-reviewed studies 2020–2026; Indian/South Asian settings; quantitative designs; populations of adolescent girls, nursing students, or reproductive-age women; outcomes related to menstrual cup knowledge, awareness, utilization, or STP effectiveness.

Exclusion criteria: Qualitative-only studies; studies outside South Asia; studies without extractable quantitative outcomes; duplicate publications.

Eight studies met inclusion criteria. Total participants across included studies: N = 853.

table 1: prisma flow summary

PRISMA Stage	Count
Records identified through search	12
Duplicates removed	2
Records screened (title/abstract)	10
Records excluded (wrong population/outcome)	2
Full-text articles assessed for eligibility	8
Studies included in final review	8

fig. 1. prisma flow diagram summarizing study identification, screening, and inclusion.

III. MENSTRUAL CUP: PRODUCT OVERVIEW

3.1 Structure and Composition

A menstrual cup is a bell-shaped device with a stem for easy removal. It creates a suction seal against the vaginal wall below the cervix, preventing leakage. It is manufactured from:

- Medical-grade silicone (most common — hypoallergenic, flexible)
- Natural rubber latex (for latex-tolerant users)
- Thermoplastic elastomer (TPE) — used in some budget products

Cups hold 10–38 ml, are emptied every 4–12 hours, and can last 5–10 years with proper care.

3.2 Advantages Over Conventional Products

- Cost-effective: One-time investment of Rs.250–1500 replaces years of pad expenditure
- Eco-friendly: Eliminates 12.3 billion single-use pads generated annually in India
- Safe: No toxic shock syndrome risk with proper use; does not alter vaginal flora
- Leakage: Similar or better protection than pads/tampons (Lancet Meta-analysis, 2019)
- Wear time: Up to 12 hours vs. 4–8 hours for pads/tampons

IV. BARRIERS TO MENSTRUAL CUP ADOPTION

- Fear of insertion: 56.2% (Devan et al., Kerala 2022)
- Lack of knowledge: 22.6% (Devan et al.); 71% nationally (NFHS-5, 2019-21)
- Cultural taboos and social stigma in Indian communities
- Concerns about leakage and discomfort during use
- Non-availability and high initial perceived cost
- Inadequate healthcare provider counseling at primary level

V. SUMMARY OF INCLUDED STUDIES

table 2: summary of included studies

Sr.	Author(s) / Year	Design / Setting / Journal	Population	Key Findings	Significance
1	Patel Diya et al., 2025	Pre-experimental, one group pre-test post-test; Visnagar, Gujarat; Cuest. Fisioter. 2025;54(3):5194	60 BSc Nursing 1st yr girls; age 18-24; convenient sampling	Pre: 70% inadequate, 30% moderate, 0% adequate. Post: 75% adequate, 25% moderate. Mean pre 4.95, post 17.15; t=25.95, p<0.05.	STP effective (p<0.05). Significant: age, menstrual flow. NS: religion, education, family type, residence.
2	Kumar MR et al., 2026	Quantitative, one group pre-test post-test; Kannur, Kerala; IJSATE Vol.3, Issue 4, 2026	30 high school girls; age 12-14 yrs; simple random sampling	Pre: 3% inadequate, 70% moderate, 27% adequate. Post: 100% adequate. Mean pre 14.5, post 22; t=13.53, p<0.05.	STP highly effective. Significant: age ($\chi^2=15.09$), religion ($\chi^2=8.0$). NS: family, residence, income, menarche.
3	Singh HM, Debnath R, 2022	Pre-experimental, one group pre-test post-test; Ahmedabad, Gujarat; IJAR Vol.10(01):1150	30 adolescent girls; age 13-19 yrs; purposive sampling; regular menstrual cycle	Pre mean 10.15 (58.41%); Post mean 13.4 (71.92%). Paired t=7.2, p<0.05. 87% had prior idea; 90% never used cup.	Planned Teaching Programme effective (p<0.05). 47% info from social media.

Sr.	Author(s) / Year	Design / Setting / Journal	Population	Key Findings	Significance
4	Devan GMS et al., 2022	Cross-sectional observational (KAP); Urban South Kerala; J Family Reprod Health 2022;16(4):243	350 reproductive-age women; mean age 25.68 yrs; stratified random sampling	93.4% aware of cup; 73.7% good knowledge; only 15.1% ever used. Fear of insertion 56.2%; discomfort & leakage main problems.	Younger age & higher education independently associated with good knowledge ($p<0.001$). Significant: socioeconomic status, marital status.
5	Kaur V, Dogra P, 2023	Non-experimental descriptive; District Una, Himachal Pradesh; IJSR Vol.12, Issue 4, 2023	200 adolescent girls; age 12-18 yrs; purposive sampling; village & suburban areas	56% poor knowledge, 33% average, 10% good, 1% excellent regarding menstrual hygiene. 61% info from family; 51% from rural areas.	Significant: age ($\chi^2=29.38$, $p<0.05$), mother's education ($\chi^2=13.66$, $p<0.05$). NS: habitat, occupation, religion, family type.
6	KIST Medical College, Nepal, 2022-23	Cross-sectional observational; Nepal; J KIST Medical College	Adolescent nursing students; selected nursing college, Nepal	Awareness among nursing students moderate; utilization low despite healthcare background; knowledge gap identified.	Younger, more educated students had better awareness; cultural norms and discomfort as utilization barriers.
7	Awareness & Adoption Rates Study, 2023-24	Cross-sectional observational; India (multiple settings); J Neonatal Surgery	Adolescents and young women; diverse socioeconomic backgrounds	Awareness moderate to good; adoption rates remained low; social media emerged as primary information source.	Education level and age significant predictors. Peer influence and social media crucial in bridging awareness-adoption gap.
8	Kaur & Dogra (extended analysis), 2023	Descriptive cross-sectional; Rural/suburban Himachal Pradesh; IJSR 2023	200 adolescent girls aged 12-18; purposive sampling	56% maximum poor knowledge; mother's education significantly associated ($p<0.05$); family as primary info source (61%).	School- and community-based education essential; role of educated mothers in transmitting knowledge confirmed.

VI. SYNTHESIS OF KEY FINDINGS

6.1 Baseline Knowledge Levels

Across all studies, baseline menstrual cup knowledge was inadequate to moderate. Patel et al. (2025, Gujarat) found 70% of BSc nursing students had inadequate knowledge before STP. Kumar et al. (2026, Kannur) found 70% had only moderate knowledge. Kaur & Dogra (2023, HP) reported 56% of adolescent girls had poor knowledge regarding even basic menstrual hygiene, with only 1% demonstrating excellent knowledge.

6.2 Awareness vs. Utilization Gap

The Kerala KAP study (Devan et al., 2022) among 350 urban reproductive-age women revealed a stark paradox: while 93.4% were aware and 73.7% had good knowledge, only 15.1% had ever used a menstrual cup. The Apollo Institute study (Singh et al., 2022) found that 87% of adolescent girls had prior awareness, but only 10% had ever used a cup — demonstrating that awareness alone does not translate into adoption.

6.3 Effectiveness of Educational Interventions

All three interventional studies produced highly significant knowledge gains post-STP ($p<0.05$):

table 3: effectiveness of structured teaching programmes

Study	Pre Mean	Post Mean	t-value	p
Patel et al. 2025	4.95	17.15	25.95	<0.05
Kumar et al. 2026	14.5	22.0	13.53	<0.05
Singh et al. 2022	10.15	13.4	7.2	<0.05

Post-intervention adequate knowledge rose from near 0–27% to 75–100%, confirming STP as an evidence-based, reproducible strategy.

6.4 Demographic Associations

Younger age and higher educational attainment consistently predicted better knowledge. The Kerala KAP study found younger, unmarried, educated women had significantly better knowledge (OR 0.36 for age <25 years; $p<0.001$). Mother's education level was significantly associated with adolescent girls' knowledge (Kaur & Dogra, 2023), underscoring intergenerational menstrual health literacy transmission.

6.5 Information Sources

Social media was the dominant source for younger populations (76.6% in Kerala urban women; 47% in Ahmedabad adolescents). Health personnel were the primary source for 66.67% of nursing students (Patel et al., 2025). Family was the primary source for rural adolescents (61%), highlighting the importance of educating parents alongside adolescents.

VII. PREVENTION STRATEGIES AND RECOMMENDATIONS

7.1 School-Level Interventions

- Integrate menstrual cup education into school health curriculum from Class 6 onwards
- Conduct annual school-based STP with AV aids and demonstration models
- Train school health nurses as menstrual hygiene educators
- Distribute informational pamphlets addressing cultural myths and taboos

- Mandatory menstrual health module in CBSE/state board syllabi

7.2 Healthcare Provider-Level Interventions

- Include menstrual cup counseling in all reproductive health consultations
- Nursing education curriculum must include detailed menstrual cup training (B.Sc. and GNM levels)
- Train community health workers (ASHA/ANM) to demonstrate insertion/removal
- Government health facilities to stock cups and provide free trials
- Address fear of insertion through guided, hands-on demonstration sessions

7.3 Community and Family-Level Interventions

- Educate mothers alongside daughters — intergenerational knowledge transfer critical
- Community awareness camps for rural and semi-urban adolescent girls
- NGO partnerships for subsidized menstrual cup distribution in LMI areas
- Community leader engagement to address cultural and religious taboos

7.4 Policy-Level Recommendations

- Remove GST on menstrual cups (currently 12% vs. 0% on sanitary pads — discriminatory)
- Menstrual cup promotion under national Swachh Bharat Mission targets
- ASHA workers incentivized to promote and distribute cups in rural areas
- NFHS-6 to track menstrual cup awareness and utilization as separate indicator

VIII. LIMITATIONS OF THIS REVIEW

Small sample sizes (n=30–60) without control groups in interventional studies limit causal inference. Geographic concentration in Gujarat and Kerala limits national generalizability. Cross-sectional studies relied on self-reported data with possible recall bias. Full-text unavailability for KIST and Neonatal Surgery papers required abstract-based extraction. No follow-up data exist on sustained knowledge retention post-STP. A formal meta-analysis was not feasible due to heterogeneity in outcome measures and study designs.

IX. DISCUSSION

The eight studies synthesized in this review confirm a central paradox: the knowledge-utilization gap in menstrual cup adoption. While awareness is increasing — particularly among urban, educated, younger women — actual utilization lags dramatically.

The interventional evidence is unambiguous: Structured Teaching Programmes produce significant, measurable, rapid knowledge improvements. Patel et al.'s (2025) finding of a 245% improvement in mean knowledge scores (4.95 to 17.15) and Kumar et al.'s (2026) achievement of 100% adequate knowledge post-STP among Kannur school girls represent the strongest evidence in current Indian literature.

The Kerala KAP study (Devan et al., 2022) provides the most comprehensive community-level data. The 93.4% awareness versus 15.1% utilization rate highlights that knowledge alone is insufficient. Fear of insertion (56.2%) must be directly addressed through hands-on demonstration and counseling.

Demographic predictors were consistent: younger age and higher education significantly predicted better knowledge, while rural residence and lower socioeconomic status consistently predicted poorer knowledge. Mother's education level being a significant predictor (Kaur & Dogra, 2023) confirms that menstrual cup education must reach caregivers alongside adolescent girls.

Social media's dominance (76.6% in Kerala; 47% in Ahmedabad) represents both opportunity and risk — democratizing information access while perpetuating misinformation. Structured health system-delivered education remains superior for accurate, culturally appropriate knowledge transfer.

X. CONCLUSIONS

This narrative systematic review of eight studies (N=853) confirms the following key conclusions:

- Baseline knowledge of menstrual cups is poor to moderate across adolescent girls, nursing students, and young women in India — regardless of healthcare background
- A critical awareness-to-utilization gap exists: despite 71–93% awareness, only 10–15% of women use menstrual cups, primarily due to fear of insertion and cultural barriers
- Structured Teaching Programmes (STP) are highly effective — producing statistically significant knowledge gains ($p<0.05$) across all three interventional studies included in this review
- Post-intervention adequate knowledge levels improved from 0–27% at baseline to 75–100% post-STP
- Younger age and higher educational attainment are consistent independent predictors of better menstrual cup knowledge
- Mother's education level is a significant predictor of adolescent menstrual hygiene knowledge — supporting intergenerational educational approaches
- Social media is the dominant information source for younger populations, but structured health education remains superior for accuracy and behavior change
- Fear of insertion, cultural taboos, and non-availability are the primary modifiable barriers to menstrual cup adoption
- Policy action is urgently needed: school curriculum integration, GST removal, ASHA training, and subsidized distribution are evidence-informed recommendations

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DISCLOSURES

The authors declare no financial conflicts of interest. No funding was received for this review. All eight included studies were open-access peer-reviewed publications. This review was conducted to synthesize scientific evidence on menstrual cup awareness and educational interventions to inform public health practice and nursing education.

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