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EXPLORING AWARENESS AND BARRIERS TO ADOPTION OF ECO-FRIENDLY MENSTRUAL CUPS: A STUDY ON KNOWLEDGE, MATERIALS, AND USAGE CHALLENGES AMONG WOMEN

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ABSTRACT

This study investigates the awareness of eco-friendly menstrual cups among 247 women respondents, focusing on understanding the knowledge of materials used, barriers to use, and factors influencing their adoption. Findings reveal that women aged 21-25 exhibit better understanding of the materials, particularly silicon (52%), than younger women aged 16-20 (37%). Notably, 51% of the younger group remain uncertain about the materials, with silicon and "Not sure" being the most common responses across both age groups. The primary barriers to use include perceived difficulty and discomfort, highlighting the need for further education and product improvements. While a strong general awareness of menstrual cups exists, detailed knowledge about their materials is limited. The study suggests that younger individuals, often in their educational phase, may benefit from enhanced educational efforts regarding the materials, benefits, and safety of menstrual cups. Cost and hygiene concerns also emerge as secondary barriers, pointing to two key areas for intervention: practical usage challenges and economic or hygiene-related issues. This research underscores the need for targeted education, clear guidelines, affordable options, and improvements in comfort and accessibility to encourage wider adoption of eco-friendly menstrual products.

Key words: Awareness, menstrual cups, Cilicon, Hygiene and body-friendly.

INTRODUCTION

ECOCAP provides a reusable ultra-soft menstrual cup and offers a 12-hour protection without a sense, odor, and flight. The eco -kanipa silicon cup can collect what is equivalent to menstrual current with a 4-tap body. With Eco-Cup Menstrual Cup, you can swim, hike, bike, do yoga, or sleep through the night knowing you're protected from leaks even after 12 hours of continuous use. Eco-Cup will help you improve your cycle and live life at your own pace (**12-hour protection).**Our menstrual cups are made from soft medical-grade silicone, the same material used in baby pacifiers, and are BPA- and phthalate-free, hypoallergenic, and free of synthetic dyes, bleach, latex, and plastics. Plus, unlike regular tampons, Eco-Cup collects menstrual fluid instead of absorbing it, leaving no residue behind, helping to reduce vaginal dryness, vaginal pH imbalance, and irritation(**Body-Friendly).** Eco-Cup silicone menstrual cups can be reused for 2 years, making them an eco-friendly purchase that reduces monthly

waste that ends up in landfills or, worse, the ocean. Even the package is made of recycled materials, such as the biodegradable plastic film provided in the cup and the bamboo cleaning brush included in the purchase. The period's price may be accumulated immediately with a gearbox and joint, not to mention the cost of replacing underwear. Unlike limited-use tampons and menstrual pads, Eco-Cup offers a safer, more cost-effective solution to your menstrual needs. Designed to last for two years, Eco-Cup menstrual cups are a smart investment for your health and the planet **(eco-friendly)**. Our eco-friendly menstrual cups have an ultra-soft finish with a round bulb shape that makes them easy to insert and remove. Eco-Cup silicone menstrual cups provide a perfect fit and are so comfortable you'll forget they're there. Our environmentally friendly cups also include an easy -to -grab stem for withdrawal. We have designed it to be both soft and super comfortable for those who suffer from sensitivity, cramps or discomfort with firmer cups (**Easy to Use).**

REVIEW OF LITERATURE

Sunanda Bharatnur& Aishwarya(2023), This study explores the awareness and usage of menstrual cups among reproductive-age women in Mangalore, India. While 91.5% of participants had heard of menstrual cups, only 1.57% used them exclusively, with 9.8% using them occasionally. Most participants were young, unmarried, and from low-income backgrounds. The study highlights that despite good awareness, the adoption of menstrual cups remains limited, largely due to traditional practices, lack of knowledge, and limited access to affordable products. Promoting menstrual cups is essential to improve menstrual hygiene management and address waste disposal issues in India.

Meghana S and Gomathy E (2021). This study assesses the knowledge, attitudes, and practices regarding menstrual cups among rural adult women. Of the 120 participants, 80% were aware of menstrual cups, with most receiving information from media, family, and friends. Despite good awareness, concerns about leakage (51.7%) and discomfort (26.7%) were major barriers to usage. While 65% of participants expressed willingness to use a menstrual cup if available, overall acceptance remains low. The study concludes that awareness is present, but greater efforts are needed to improve acceptance and address concerns.

The "MHM in Ten" initiative, launched in 2014, aims to improve menstruation management in schools globally by 2024. The mid-term review in 2019 highlights significant progress in strengthening the evidence base and increasing advocacy efforts. However, the absence of global guidelines, lack of resources, and incomplete integration into national education systems remain challenges. Governments are increasingly taking ownership, but further research, policy expansion, and funding are essential for sustained progress. The paper offers recommendations to maximize MHM impact, emphasizing the need for continued commitment and support.

Vashisht et al. (2018)This study focuses on the impact of poor menstrual hygiene management on girls' education and well-being. It highlights how inadequate management leads to shame, anxiety, and embarrassment, contributing to school absenteeism and poor academic performance. The study aims to determine the percentage of girls missing school during menstruation and evaluate the factors influencing this absenteeism. It emphasizes the critical role of addressing menstrual health for girls' broader participation in societal, economic, and political life.

OBJECTIVES OF THE STUDY

The followingobjectives are to be considered for the research:

To find the demographic profile of respondents by using menstrual cups.

1. To find the respondents'awareness about menstrual cups.
2. To analyzethe respondents'knowledge about menstrual cups.
3. To analyze the respondent's generalawareness of sustainability by using menstrual cups and the barriers to adopting it

TECHNIQUES

The study's technique is both descriptive and diagnostic.

A systematic approach to data collection and analysis aimed at examining young women's awareness of eco-friendly menstrual cups and analyzing the respondent's general awareness of sustainability by using menstrual cups. The gathering of surveys and historical data is part of the research approach.

Areas covered	Chennai City, Tamil Nadu, India,
Data source	Both primary and secondary
sample size	164 is the sample size.
sampling technique used	Stratified Random Sampling
Data Tool	Structured Questionnaire
Method of gathering data	Google forms.

LIMITATIONS OF THE STUDY

- This study covers the area of Chennai City, Tamil Nadu only.
- Only the agegroup of 16-25 are involved in thisresearch.
- The sample size was collected only from college-going girls.

DATA ANALYSIS AND INTERPRETATION

Descriptive analysis was performed using the mean and standard deviation for quantitative variables, and frequency and proportion for categorical variables. Data was presented using suitable graphical representations. The relationship between explanatory variables and KAP was evaluated by comparing mean values for quantitative variables using an unpaired t-test. Categorical variables were compared using cross-tabulation and percentage comparisons. The Chi-square or Fisher's exact test was applied to assess statistical significance. A p-value of < 0.05 was considered statistically significant. Statistical analysis will be performed using IBM SPSS version 20.

The following data insights into a group's demographic and financial characteristics.

Table 1

Respondent's demographic variables

Parameter	**Frequency**	**Percentage**
Age		
16-20 years	193	78.1%
21-25 years	54	21.9%
Total	**247**	**100%**
Educational Status		

Undergraduate	187	75.7%
Graduate	5	2.0%
Postgraduate	55	22.3%
Total	**247**	**100%**
Family (Monthly) income		
<Rs.25,000	151	61.1%
Rs. 25,000 – Rs. 50,000	45	18.2%
Above Rs. 50,000	51	20.6%
Total	**247**	**100%**

Source: Original data

From the above table, we found that most respondents (78.1%) are between the ages of 16-20 years, with a smaller portion (21.9%) aged 21-25. Most individuals are undergraduates (75.7%), followed by postgraduates (22.3%) and a few graduates (2.0%). Regarding family income, the largest group (61.1%) comes from households earning less than Rs. 25,000 monthly. A smaller proportion of families earn between Rs. 25,000 to Rs. 50,000 (18.2%) or above Rs. 50,000 (20.6%).

Table 2

A descriptive analysis of respondent's awareness of menstrual cups in the study population.

Parameter	Frequency	Percentage
Awareness of menstrual cups		
Yes	196	79.4%
No	51	20.6%
Total	247	100%

Source: Original data

From the above table, the majority of respondents (79.4%) are aware of menstrual cups, while a smaller group (20.6%) is not familiar with them. This suggests a relatively high level of awareness regarding menstrual cups within the study population. The findings indicate that many individuals are informed about alternative menstrual products. However, there is still a significant portion who are unaware, highlighting potential areas for awareness campaigns. Overall, the data reflects a positive trend toward menstrual cup awareness.

Table 3

Knowledge about the materials used for making menstrual cups

Parameter	Frequency	Percentage
Knowledge of materials used for making menstrual cups.		
Silicon	99	40.1%
Rubber	24	9.7%
Latex	5	2.0%
Not sure	119	48.2%
Total	247	100%

Source: Original data

Table No. 3 indicated that 40.1% of respondents are aware that silicon is used in menstrual cups, but this still represents a minority of the sample.9.7% of respondents know that rubber is used, and only 2.0% are aware of latex.48.2% of respondents are not sure about the materials used, indicating a significant knowledge gap.This suggests that there may be a need for better educational efforts to inform people about the specific components of menstrual cups, their benefits, and safety profiles.

Table 4

Menstrual cups are considered an eco-friendly option

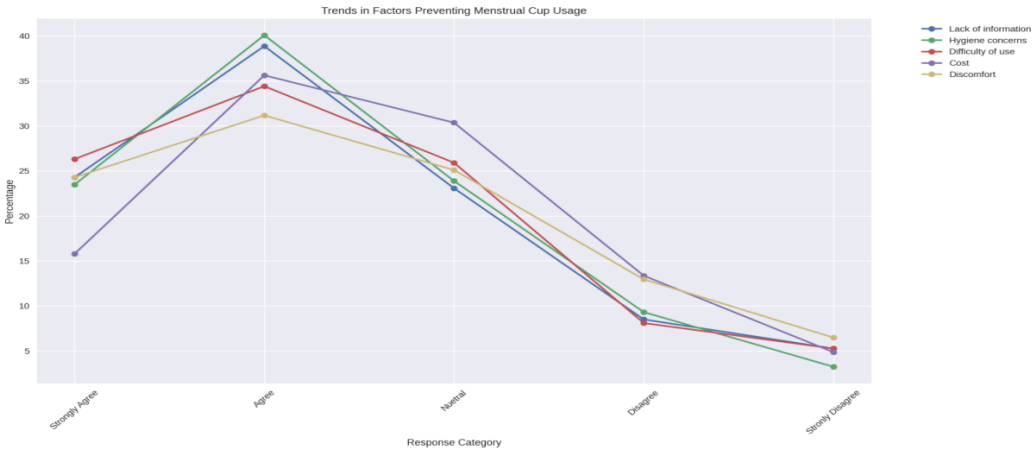
Parameter	Frequency	Percentage
Considered an eco-friendly option		
Yes	181	73.3%
No	66	26.7%
Total	247	100%

Source: Original data

Table no.4 points out that a significant majority of respondents **(73.3%)** view menstrual cups as an **eco-friendly** option and **26.7%** of the respondents do not consider menstrual cups to be an eco-friendly option. This is a positive sign, as menstrual cups are widely recognized for being a sustainable alternative to single-use menstrual products such as pads and tampons. The perception of menstrual cups as environmentally friendly likely stems from their long lifespan.

A descriptive analysis of Trends in factors preventing menstrual cup usage

The following diagram shows the factors preventing menstrual cup usage such as lack of information, hygiene concerns, difficulty of use, cost, and discomfort.



Source: Original data

Figure 1: Factors preventing menstrual cup usage

From the above figure, we know that the factors are preventing the widespread adoption of menstrual cups, with the most significant being concerns about hygiene (63.6%) and lack of information (63.2%). Other barriers include difficulty of use (60.7%), cost (51.4%), and discomfort (55.5%). These factors suggesta substantial need for education, product adjustments, and greater accessibility to overcome these challenges.

Discussion

The **highest concern** (63.6%)among respondents is **hygiene**. A significant proportion of the population is worried about the cleanliness and safety of using menstrual cups, potentially due to concerns about proper sterilization, leakage, or infection. Menstrual cups require regular

cleaning and proper handling, which can cause anxiety for those unfamiliar with the product or its maintenance. Not everyone in the environment has equitable access to menstrual hygiene products, clean water, sufficient sanitary facilities, and health education according to **Magda Kalinowska (2024).**

Close behind hygiene concerns, **63.2%** of respondents cited **lack of information** as a major barrier. This suggests that many people do not have enough knowledge or clear guidance on how menstrual cups work, how to use them, or how to maintain them. Without proper information, people may feel uncertain or hesitant about trying menstrual cups.

The **difficulty of use** is also a common barrier, with **60.7%** of respondents expressing this concern. Menstrual cups may seem intimidating to some due to the need for correct insertion and removal, as well as the unfamiliarity of handling the product compared to more conventional menstrual products like pads and tampons.

Costconcerns**51.4%** of respondents, suggesting that the upfront price of menstrual cups might deter some individuals from making the switch, even though menstrual cups are cost-effective in the long run. This concern may be more significant among people from lower-income backgrounds who are sensitive to initial investment costs. According to the **Pinkishe Foundation**, menstrual cups are cost-effective and often made from durable materials that provide long-term value.

Discomfort is another notable barrier, with **55.5%** of respondents expressing concerns about the physical comfort of using a menstrual cup. Issues like finding the right fit, potential leakage, or the sensation of having a foreign object inside the body may contribute to this discomfort. Dr. Sana Haider and **Dr. Sadiqunnisa (2023),** diagnosed that the main issue with menstrual cup use was discomfort.

Table 5

Awareness by Age Group

Age Group	Yes	No	Total
16-20 years	44	149	193
21-25 years	7	47	54
Total	51	196	247

Source: Original data

Table 5 reveals low awareness of menstrual cups across both age groups. Among those aged 16-20, only 22.8% are aware, with a much lower 12.9% awareness in the 21-25 age group. Only 20.6% of the total sample (247 individuals) reported awareness. This highlights a significant knowledge gap that needs to be addressed to increase awareness and adoption of menstrual cups.

Table 6:

Knowledge of Materials by Age Group

Age	Latex	Not Sure	Rubber	Silicon	Total
16-20 years	3	99	20	71	193
21-25 years	2	20	4	28	54
Total	5	119	24	99	247

Source: Original data

From the above table, we find that, among the 16-20-year age group, the majority are unsure about the materials used in menstrual cups, with 99 respondents expressing uncertainty. Silicon is the most recognized material (71 respondents), followed by rubber (20 respondents) and latex (3 respondents). In the 21-25 years age group, a similar trend is observed, with 28 individuals aware of silicon and only 2 identifying latex. Overall, silicon is the most commonly recognized material across both age groups, while a significant portion of respondents remain uncertain about the materials used in menstrual cups. This suggests a need for increased education on the materials.

Table 7

Awareness of Menstrual cups by Educational Qualification

Educational Qualification	Latex	Not Sure	Rubber	Silicon
Graduates	0	20	0	80
Postgraduate	3.636364	40	5.454545	50.90909
Undergraduate	1.604278	51.3369	11.22995	35.82888

Source: Original data

Table 7 shows that the awareness of menstrual cup materials varies significantly across educational qualifications. Among graduates, most are aware of silicon (80%) but are unsure about the other materials, with no recognition of latex or rubber. Postgraduates show a more balanced distribution, with some awareness of latex (3.64%), rubber (5.45%), and a notable 50.91% recognizing silicon. Undergraduates, the largest group, exhibit the highest uncertainty (51.34%) and a relatively smaller awareness of latex (1.6%), rubber (11.23%), and silicon (35.83%). Overall, the data suggests that awareness of menstrual cup materials increases with educational qualification, especially for silicon.

Table 8:

Eco-friendly perception by Educational Qualification

Educational Qualification	No	Yes
Graduate	80	20
Postgraduate	21.81818182	78.18181818
Undergraduate	26.73796791	73.26203209

Source: Original data

Table 8 shows that eco-friendly perception varies by educational qualification. Graduates have the lowest eco-friendly perception, with only 20% viewing menstrual cups as eco-friendly, while postgraduates have the highest, with 78.2% recognizing their environmental benefits. Undergraduates also show a strong eco-friendly perception at 73.3%. This suggests that higher education levels are associated with a greater awareness of the environmental benefits of menstrual cups.

Table 9:

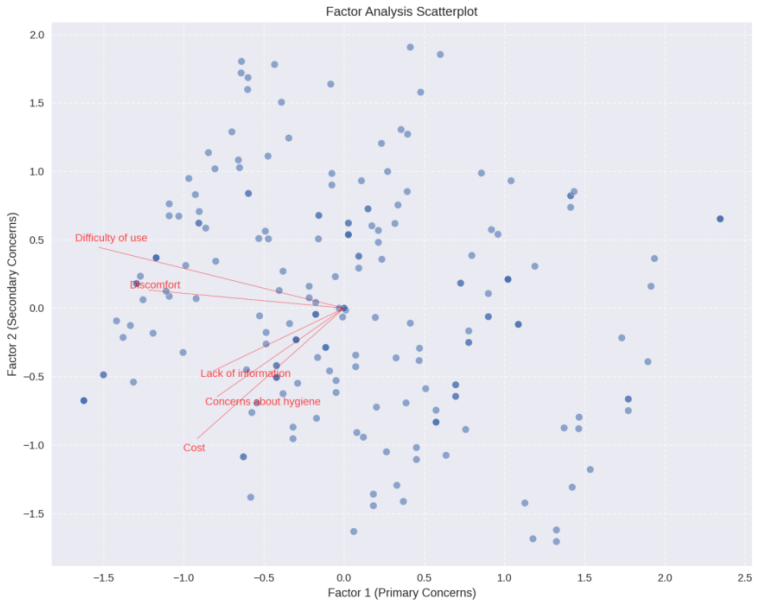
Knowledge of Materials by Educational Qualification

Educational status	Latex	Not sure	Rubber	Silicon
Graduate	0	20	0	80
Postgraduate	3.636363636	40	5.454545455	50.90909091
Undergraduate	1.604278075	51.3368984	11.22994652	35.82887701

Source: Original data

Table 9 indicates that graduates have the highest awareness of menstrual cup materials, with 80% recognizing silicone, while 20% are unsure. Postgraduates show a more varied awareness, with 50.9% identifying silicone and 40% uncertain. Undergraduates have the highest uncertainty at 51.3%, with a smaller percentage (35.8%) identifying silicone. This suggests that higher educational levels are linked to better knowledge of menstrual cup materials.

Factors prevented using menstrual cups



Source: Original data

Figure 2: Factors prevented using menstrual cups

The above figure identifies two key factors influencing adoption. Factor 1, labelled as Primary Concerns, has strong negative associations with “Difficulty of use” (-0.76) and "Discomfort" (-0.61), highlighting these as the main barriers to menstrual cup adoption. Factor 2, or "Secondary Concerns," is primarily influenced by "Cost" (-0.48) and "Hygiene concerns" (-0.32), suggesting these factors also play a role, though secondary. Interestingly, "Difficulty of use" has a positive loading (0.22) in Factor 2, suggesting a more complex relationship in how it impacts adoption. The scatter plot visually illustrates the strength and direction of these relationships through red arrows.

FINDINGS

- 21-25-year-olds have better knowledge of correct materials (Silicon: 52%) compared to 16-20-year-olds (37%).
- A large portion of 16-20-year-olds (51%) are "Not sure" about materials
- Silicon and "Not sure" are the most common responses across both age groups.
- Difficult use and discomfort are closely related and form the primary barrier.
- Cost and hygiene concerns form a secondary, separate dimension of concerns
- The factors suggest two distinct areas for intervention: practical usage concerns and economic/hygiene concerns

SUGGESTIONS

- This research suggests that the general awareness of menstrual cups is high and detailed knowledge about the materials of menstrual cups is lower, particularly among younger respondents. This indicates that educational interventions might be most effective if they focus first on addressing usage difficulties and comfort concerns, followed by addressing cost and hygiene misconceptions
- It suggests that the sample primarily comprises younger individuals, likely in their educational phase (such as school or early college).
- It suggests that there may be a need for better educational efforts to inform people about the specific components of menstrual cups, their benefits, and safety profiles.
- These factors suggest a substantial need for education, product adjustments, and greater accessibility to overcome these challenges.

CONCLUSION

There is a strong awareness of menstrual cups among the sample, with a significant portion of the group being informed about this alternative to traditional menstrual products.while awareness of menstrual cups is high, there is a clear lack of detailed knowledge about the materials they are made from. Menstrual cups are generally seen as an environmentally conscious choice, but the remaining skepticism should be addressed through targeted education and transparent communication about the sustainability and eco-friendly features of the product.This research also contributes that the Key actions should focus on enhancing awareness, providing clear guidelines for usage, ensuring hygiene safety, offering affordable options, and addressing comfort.Ultimately, addressing these concerns can help increase confidence and reduce hesitation among potential users, paving the way for wider acceptance and use of menstrual cups as a sustainable and eco-friendly menstrual product.

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