

Original Research Article

Analyzing the relationship between menstrual product usage, awareness of sustainable options, and health outcomes in Lucknow

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Received: 26 May 2025

Revised: 07 July 2025

Accepted: 08 July 2025

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ABSTRACT

Background: Menstrual health is a crucial aspect of women's overall well-being, influencing personal hygiene, environmental sustainability, and social participation. In developing urban areas such as Lucknow, menstrual product usage patterns and awareness of sustainable alternatives can significantly affect both individual health and environmental outcomes. This study explores menstrual product usage among women in the Lucknow region, with a focus on sustainable well-being and environmentally responsible practices.

Methods: A cross-sectional survey was conducted using a structured questionnaire to collect data from 110 women of reproductive age in the Lucknow region. The questionnaire covered menstrual product usage, awareness of sustainable alternatives, factors influencing product choices, and disposal practices. Data were analyzed to identify trends and barriers related to sustainable menstrual health practices.

Results: Disposable sanitary pads emerged as the most commonly used menstrual product among participants. Awareness of sustainable alternatives- such as menstrual cups and reusable cloth pads- was low. Key barriers to adoption of sustainable products included affordability, cultural perceptions, and lack of education about their benefits. The study also found that improper disposal of menstrual products is common, contributing to environmental degradation.

Conclusions: This study highlighted a significant gap in awareness and adoption of sustainable menstrual health products in Lucknow. Addressing this requires targeted interventions such as awareness campaigns, improved access to affordable sustainable products, and community-led initiatives to normalize eco-friendly menstrual practices. Promoting informed choices and proper disposal methods is essential to improving both personal and environmental well-being.

Keywords: Environmental issues, Menstruation, Menstrual health, Menstrual products, Sanitary napkins, Sustainable

INTRODUCTION

Menstrual health is a fundamental yet often overlooked aspect of women's overall health and well-being. It affects not only physical health but also, emotional and psychological stability, social participation, education, and employment. Proper menstrual hygiene management enables women and girls to manage menstruation safely,

hygienically, and with dignity. Access to adequate menstrual products, appropriate sanitation facilities, and accurate information is essential to ensuring that menstruation does not become a barrier to full societal participation.

This study aimed to investigate the patterns of menstrual product usage among women in Lucknow, with a focus

on how income levels influence choice, awareness, and access to various menstrual products. By examining both traditional and sustainable options, this research will explore the socio-economic and cultural factors that shape women's menstrual health practices. There have been different research and sets that talked about the menstrual health. Highlights that poor menstrual hygiene can lead to reproductive tract infections and other health complications.¹

In urban areas like Lucknow, despite the fact of high awareness and accessibility, disparities persist across socio-economic groups. Women from lower-income households are less likely to afford commercially available menstrual products and often have limited awareness about safe and sustainable alternatives. In contrast, women from higher-income groups may have greater exposure to and access to a wider range of menstrual products, including sustainable options like menstrual cups and reusable cloth pads. Reusable menstrual products such as period underwear, reusable pads and menstrual cups are alternatives to disposables and may offer greater environmental and cost sustainability.²

The cultural barriers, compounded by poverty and lack of infrastructure, especially in rural and economically disadvantaged urban communities, lead to poor menstrual hygiene practices. Many women and girls lack consistent access to sanitary products and may resort to unhygienic alternatives such as old cloths, newspapers, or even ash, increasing the risk of infections and reproductive health issues.

A recent environmental assessment found that over one year, the environmental impact of a menstrual cup was equal to less than 1.5% of the environmental impact of a disposable product, at only 10% of the cost of disposables.²

The study by Sol et al. that engaged parents found a positive effect on menstrual hygiene management and school attendance.³ Another study by Agbede et al looking at the combined effect of peer and parent educational interventions had the highest mean score of menstrual hygiene management practice among its study arms.⁴ The impact of menstrual hygiene interventions on lower genital tract infections was assessed. Though non-significant, there was a lower prevalence of lower genital tract infections among the pooled menstrual cup plus sanitary pad arms, as compared to non-intervention arms.⁵ Interventions for sustainable menstrual health-several initiatives and campaigns have been launched to promote menstrual hygiene awareness in India. Programs such as "menstrual hygiene day" and government initiatives like the "Suvidha scheme" aim to improve access to affordable sanitary products.

This study aimed to investigate the patterns of menstrual product usage among women in Lucknow, with a focus

on how income levels influence choice, awareness, and access to various menstrual products. By examining both traditional and sustainable options, this research will explore the socio-economic and cultural factors that shape women's menstrual health practices. Additionally, it seeks to identify key barriers to the adoption of sustainable menstrual products and assess the level of awareness and acceptance among different demographic groups. The findings are intended to inform targeted interventions, awareness campaigns, and policy recommendations to improve menstrual health literacy and promote environmentally responsible menstrual hygiene practices in urban Indian contexts.

METHODS

This study was a mixed-method approach, combining quantitative survey data with qualitative insights from participants. The research design includes the following key components:

Study area and population

The study was conducted in Lucknow, India, targeting women of reproductive age (15-49 years) across different income groups. A total of 110 participants were selected through purposive sampling to ensure diverse representation.

Data collection

A structured questionnaire was used to collect quantitative data on menstrual product usage, awareness levels, and disposal practices. Focus areas include: types of menstrual products used, factors influencing product choice (cost, accessibility, cultural beliefs, etc.). Awareness and perceptions of sustainable menstrual products, disposal methods and environmental concerns.

Data analysis

The quantitative data was analyzed using descriptive statistics, including frequency distributions and percentages. Qualitative responses were thematically analyzed to identify key challenges and perceptions regarding menstrual hygiene practices.

Ethical considerations

Informed consent was obtained from all participants before data collection. Confidentiality and anonymity of respondents were maintained throughout the study.

Research design

This study employed a cross-sectional survey design to collect data on menstrual product usage, awareness of sustainable products, and health outcomes. The survey was distributed by distributing questionnaire, ensuring broad responses were anonymized to encourage candid

participation. The total sample consisted of more than 100 participants over a time period of October 2024 to May 2025.

Participants

Participants were recruited from a variety of demographics, including different age groups, socioeconomic backgrounds, and education levels. The age range of participants was between 18 and 45 years.

Inclusion criteria

Women aged 15 to 49 years (reproductive age group). Residents of Lucknow, India. Willing to participate voluntarily and provide informed consent. Belonging to various income groups (low, middle, high) to ensure socio-economic diversity. Currently menstruating or having menstruated in the past year (to ensure relevance to product usage and practices).

Exclusion criteria

Women below 15 years or above 49 years of age. Women who were pregnant or in post-menopausal stage at the time of the study. Individuals who decline to participate or do not provide informed consent. Women with medical conditions that prevent menstruation (e.g., hysterectomy, hormonal disorders) and are thus not using menstrual products. Non-residents or temporary visitors to Lucknow.

Survey instrument

The survey consisted of three sections: demographic information: age, socioeconomic status, and educational background. Menstrual product usage: types of products used, frequency of usage, and reasons for product choices. Health and well-being: questions focused on menstrual cramps, PMS symptoms, and general discomfort during menstruation. Awareness of sustainable options: participants' knowledge of menstrual cups, reusable pads, and organic cotton products, as well as their willingness to adopt these alternatives.

Data analysis

Data were analyzed using descriptive statistics to summarize the demographics and product usage patterns. Correlational analysis (Pearson's r) was employed to assess the relationship between product usage and health outcomes, while chi-square tests were used to examine differences in awareness and adoption based on demographic factors.

RESULTS

The following table relates the basic characteristics of the subjects-

Table 1 shows distribution of the candidates with respect to the education, employment status, and monthly income.

Table 1: Demographic distribution of respondents.

Grade level	No. of candidate	Unmarried	Married
Primary (up to 5 th grade)	2	1	1
Secondary (6 th to 10 th grade)	5	1	4
Higher Secondary (11 th to 12 th grade)	7	7	0
Graduate (Bachelor's degree or equivalent)	44	38	6
Postgraduate or above	52	46	6
Employment status			
Employed (full-time or part-time)	10	0	10
Self-employed	3	2	1
Unemployed	7	7	0
Student	87	80	7
Homemaker	3	2	1
Monthly income			
Less than 10,000	36	32	4
10,000-30,000	18	13	5
30,000-50,000	24	20	4
More than 50,000	31	26	5

The age-wise distribution by income group reveals that the majority of individuals earning less than ₹10K were concentrated in the younger age brackets, particularly around age 18. Higher income categories such as ₹30K-50K and more than ₹50K show a broader spread across

older age groups, indicating an increase in earnings with age and experience. The ₹10K-30K category exhibits a relatively balanced distribution across mid-20s to early 30s.

This trend suggests a positive correlation between age and income level, consistent with expected career progression in Table 1.

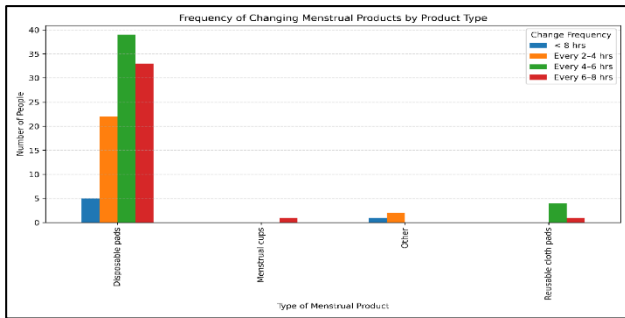


Figure 1: Frequency of changing menstrual products by product.

Figure 1 describes the plot reveals that disposable sanitary pads are the most widely used menstrual product, with the majority of users changing them every 4-6 hours or 6-8 hours, indicating consistent hygiene practices. In contrast, reusable cloth pads and menstrual cups were used by fewer respondents, with cloth pad users mostly changing every 4-6 hours. Very few participants reported using tampons or other products. Overall, the data suggests a strong preference for disposable products, with a general trend toward changing them at moderate to longer intervals.

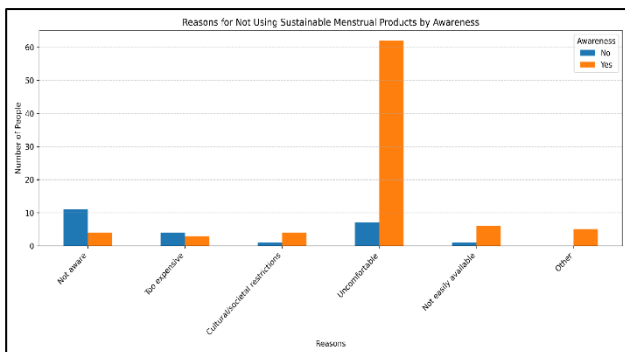


Figure 2: Reasons for not using sustainable menstrual products by awareness.

Figure 2 describes the analysis of responses to Q11 and Q13 reveals that discomfort is the most frequently cited barrier to adopting sustainable menstrual products, particularly among those who were aware of them. Interestingly, lack of awareness was a primary reason among individuals who reported not being aware of such products. Cultural or societal restrictions, cost, and availability were less commonly mentioned across both groups. This suggested that while awareness campaigns are essential, efforts must also focus on addressing misconceptions and improving user comfort. Tailored educational interventions may enhance acceptance and usage of sustainable menstrual products.

Table 2: Demographic breakdown.

Demographic factors	Percentage
Age (in years)	
18-24	55
25-34	30
35-45	15
Socioeconomic status	
Middle class	40
Lower-middle class	35
Upper-middle class	25
Educational background	
Undergraduate studies	45
Postgraduate degrees	35
High school diploma or less	20

Table 3: Menstrual product usage.

Product type	Percentage of participants
Disposable pads	65
Tampons	20
Sustainable products (menstrual cups, reusable pads)	15

Table 3: Awareness of sustainable options.

Awareness of sustainable products percentage of participants	
Aware of sustainable options	40
Aware and interested in adoption	70
Not aware	60

Table 4: Health outcomes.

Health outcome	Disposable product users	Sustainable product users
Menstrual cramps (moderate to severe)	70%	35%
PMS symptoms (severe)	50%	30%
General discomfort (itching, rashes)	50%	20%

DISCUSSION

The study revealed several notable patterns in how women in Lucknow use and perceive menstrual products. Disposable sanitary pads were the most widely used, with about 65% of the participants preferring them during menstruation. This preference cuts across income levels, suggesting that convenience, availability, and familiarity play a larger role in product choice than cost or environmental concerns. Many women reported that they used sanitary pads simply because they were easy to find and use, rather than out of specific preference for or against sustainable options.

In contrast, the use of sustainable products- such as menstrual cups, reusable pads, and period underwear- was relatively limited. Only around 35% of participants had used any kind of reusable menstrual product, and awareness of these alternatives remained low. About 15% of women surveyed had never heard of options like menstrual cups. Cultural beliefs, misinformation, and social taboos contributed heavily to this knowledge gap. For example, some participants believed that menstrual cups might impact fertility or virginity, reflecting deep-rooted myths that continue to influence menstrual choices.

The reluctance to switch to reusable options is not solely cultural; economic and practical concerns also play a major role. While sustainable products can be cheaper in the long term, the initial cost discourages many potential users, especially those from lower-income households.⁶ In some cases, products were not easily available in nearby markets, making them less accessible for women in semi-urban or low-income areas. Moreover, for many women, especially younger girls, conversations about menstruation remain uncomfortable. A lack of open discussion within families- particularly between mothers and daughters- prevents the spread of accurate information and support for trying new products.

Interestingly, women who did use menstrual cups or reusable pads often reported experiencing fewer menstrual cramps and less discomfort. This supports the idea that products made from natural or non-synthetic materials may be gentler on the body. However, these benefits are not well known among the general population, indicating a gap in health education related to menstruation. Social norms and stigma continue to shape menstrual behavior significantly. Many women avoid discussing menstruation or menstrual products openly, which limits the possibility of learning about alternatives. This cultural silence discourages women from experimenting with newer or less familiar products, especially those that require internal use.⁷ These findings mirror those from similar studies in other regions of India, such as in Nagpur district, where girls cited cost, discomfort, and parental restrictions as reasons for not using sanitary napkins.⁸

Educational outreach emerged as a key factor influencing product choice. Women who had access to accurate information about menstrual health and environmental sustainability were more likely to consider using sustainable products.⁹ Campaigns that highlight both the health and environmental benefits of alternatives could help shift perceptions. Involving local influencers, community health workers, or peer educators may be particularly effective in spreading awareness and breaking long-standing taboos.¹⁰ From a broader health perspective, the results suggest that menstrual health should be more deeply integrated into public health programs. Schools, colleges, and workplaces offer good opportunities to share information and distribute products,

particularly to younger women who are forming habits that may last a lifetime. Training healthcare workers to speak openly and sensitively about menstruation could also provide crucial support for women seeking guidance.¹¹

While this study provides valuable insights into menstrual product usage and awareness in the Lucknow region, several limitations should be acknowledged:

Sample size and sampling method

The study was conducted with a relatively small sample of 110 participants, selected through purposive sampling. While efforts were made to ensure diversity, the sample may not fully represent the broader population of women in Lucknow or other regions.

Geographic scope

The study was limited to women residing in Lucknow, India. Therefore, the findings may not be generalizable to women in rural areas or other urban centers with different socio-economic and cultural dynamics.

Self-reported data

The study relied on self-reported data through questionnaires, which can be subject to recall bias or social desirability bias, especially given the sensitive nature of menstruation and associated stigma.

Lack of longitudinal data

The research presents a cross-sectional snapshot of menstrual practices and perceptions at one point in time. It does not track changes in behavior or awareness over time.

Limited clinical data

While health outcomes like cramps and discomfort were discussed, these were not clinically evaluated. The study relied on participants' personal perceptions, which may not capture the full medical picture.

Cultural sensitivity

Some participants may have felt hesitant or uncomfortable discussing menstrual practices openly, possibly limiting the depth of responses and affecting the accuracy of some findings.

CONCLUSION

This study offers meaningful insights into how menstrual product choices relate to women's health and the challenges surrounding the adoption of sustainable options. Findings suggest that sustainable menstrual products- such as menstrual cups and reusable pads- are

linked to fewer reports of menstrual cramps, milder PMS symptoms, and reduced overall discomfort. Despite these benefits, disposable sanitary pads remain the dominant choice among women in Lucknow, largely due to their convenience and the familiarity built through long-standing usage habits.

However, this widespread reliance on disposable pads raises environmental concerns. Many of these products contain plastic and are not biodegradable, contributing significantly to landfill waste and posing health risks to sanitation workers through unsafe disposal practices. Promoting sustainable menstrual choices is therefore not only a matter of improving personal health but also addressing broader environmental and public health issues.

To encourage greater adoption of eco-friendly menstrual products, efforts must focus on increasing awareness, making sustainable options more affordable, and addressing the cultural stigma that still surrounds menstruation. Collaborative action from policymakers, health professionals, educators, and environmental advocates will be essential in building a more informed, sustainable, and health-conscious future for menstrual care.

Recommendations

The talk about the sustainability may sound smaller in the pages but, is a major concern when it comes to health practices in all. The issues can be resolved only when a major programme on a national level in a country like is made.

Also, the expense is a high issue for the products that are sustainable to the environment, and there the need is to make a user friendly, sustainable, and not expensive product so that all in all people can relate themselves and make use of it.

Funding: No funding sources

Conflict of interest: None declared

Ethical approval: The study was approved by the Institutional Ethics Committee

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Cite this article as: Dixit M, Pandey A, Bajpai M, Shukla A. Analyzing the relationship between menstrual product usage, awareness of sustainable options, and health outcomes in Lucknow. Int J Community Med Public Health 2025;12:3669-74.