

Understanding Menstrual Hygiene Knowledge, Practices and Preferences among Female University Students in Bangladesh

By

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Declaration

It is hereby declared that

1. The thesis submitted is my own original work while completing degree at BRAC University.
2. The thesis does not contain material previously published or written by a third party, except where this is appropriately cited through full and accurate referencing.
3. The thesis does not contain material which has been accepted, or submitted, for any other degree or diploma at a university or other institution.
4. I have acknowledged all main sources of help.

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Approval

The project titled “Understanding menstrual hygiene knowledge, practices and preferences among female university students in Bangladesh” submitted by Md. Mehidi Hasan-20346026 of Summer 2020, has been accepted as satisfactory in partial fulfillment of the requirement for the degree of Bachelor of Pharmacy on Summer 2024.

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Ethics Statement

The study does not involve any animal or human trial.

Abstract

Optimal personal hygiene is a vital aspect of women's health and dignity, especially at the time of young adulthood when lifestyle and awareness both experience considerable shift. The present research sought to measure the extent of awareness, usage habits and effectiveness perceptions of personal hygiene items among female students pursuing higher education in Bangladesh. The research followed a descriptive cross-sectional survey design with 258 respondents across four academic fields: Health Sciences, Arts, Business and Health Science than other Sciences. Data were collected with a structured Google Form survey questionnaire and edited entirely with Microsoft Excel for coding, cleaning and descriptive statistical analysis, including frequencies and percentage distributions. Based on the results, there was moderate personal hygiene knowledge among most of the participants but more misconceptions and irregular behavior in non-health fields. The most widely used product was sanitary pads, with the reusable cloths and menstrual cups as substitutes. Socioeconomic status also played a very strong role in choice and usage frequency. Overall, satisfaction was high, but concern pertaining to affordability and easy availability continued. Findings stress the imperative for evidence-based school education interventions and affordability of products in schools in order to improve menstrual health literacy and promote sustainable hygienic practices among young women in Bangladesh.

Keywords: Menstrual hygiene management, awareness, usage patterns, product utilization, female university students.

Dedication

This research is lovingly dedicated foremost to my parents. Their boundless love, unfailing encouragement and steadfast support have remained the pillars of my academic and personal successes. Their unwavering confidence in my abilities has constantly stimulated me to strive for excellence in all things.

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Glossary

Awareness: A condition of knowledge, understanding, and awareness a person possesses on a particular topic, e.g., health habits and hygiene behaviors.

Personal Hygiene Products: Products used to maintain cleanliness and health among individuals, particularly women. For the case in the present study, they are sanitary pads, menstrual cups, tampons and cloths.

Menstrual Hygiene Management: A comprehensive strategy incorporating the use of clean menstrual products, privacy when changing materials and appropriate disposal and sanitation practices.

University Going Female Students: Female students who are studying undergraduate & postgraduate programs in universities in Bangladesh in various fields of study.

Perceived Effectiveness: Subjective evaluation of the degree to which a product is judged to keep one clean, comfortable and safe when used.

Usage Pattern: Begin and how often an individual uses hygiene products, including kind, duration And replacement behavior.

Cross-Sectional Study: Research design that brings together information from respondents at one point in time to compare the occurrence of habits, attitudes or conditions.

Descriptive Statistics: Statistical methods, such as frequency and percentage, used to describe and summarize the most important features of data collected in quantitative form.

Informed Consent: Voluntary consent given by participants after they are well informed about the aims, methods, risks and benefits of research.

Chapter 01: Introduction

1.1. Background of the Study

1.1.1. Global Context

Menstrual hygiene is increasingly being acknowledged as both a public health matter & a human rights issue. It is estimated that over 300 million women globally are menstruating at any one moment. But nearly 500 million lack access to affordable menstrual hygiene products and sanitation facilities. Poor menstrual hygiene relates to a higher risk of urinary & reproductive tract infections due to extended use of absorbents, damp cloths, and unhygienic conditions. Besides, menstrual shame & inadequate access to menstrual education are among the school and working days absence causes. Teenage girls in Bangladesh, for example: have a loss of 2.8 days per menstrual cycle in terms of facility access and social embarrassment (Alam et al., 2022). Stigma including shame, secrecy and misinformation globally undermines mental health and with anxiety, loneliness and depression arising at times.

1.1.2. Regional/Local Context (Bangladesh)

In Bangladesh, premenstrual knowledge remains low 30% of women knew about menstruation before menarche. Self-reporting among adolescent girls living in slum areas reveals that 47% use sanitary pads & the rest use cloth, tissue or other materials using unwashed clothes with antiseptics and dried in the sun. Social taboos help to sustain these practices. Social myths still disenfranchise menstruation as dirty excluding women from the bathing pool, cooking or even touching water. Inadequate wash facilities broken privacy, lack of disposal bins or safe menstrual waste disposal also constrain menstrual hygiene behaviors.

1.1.3. Why University Students?

Female university students are at a vulnerable stage of transition. Those who are more likely to have more control over health related decision-making still face cultural stigma based information gaps & under-resourced environments. Even if the students may enjoy enhanced access to information, the factors of menstrual management (e.g., university bathrooms with no bins, limited menstrual products) can exclude hygienic practice. Universities are potential intervention settings which are spaces for peer-to-peer learning, university health centers & short term renovation of wash facilities. Empowering university students can catalyze broader social and behavior change because they can become future influencers and champions of menstrual health and gender equity.

1.2. Problem Statement

1.2.1. Knowledge Gaps

Whereas most university female students in Bangladesh are theoretically knowledgeable about menstruation, significant gaps remain in applied hygiene skills. A national survey of early reproductive aged women including many students reported mean scores to be only moderate in menstrual hygiene knowledge & contained significant misconceptions on how to avoid infection and hygienic practices. Most importantly, the students lack information regarding mechanisms that lead to urinary or reproductive tract infection especially when using reusable cloths inappropriately or failing to practice regular changes (Siddique et al., 2023). Furthermore, informal sources such as peers and social media, influence students' information environment, predisposing them to provide fractured or erroneous advice. In a research of Bangladeshi slum populations, it was found that sisters, mothers and friends were the predominant sources of information though these sources tended to distribute myths rather than medically correct practices. In aggregate, this creates a "knowing vs. doing" gap: students may know about menstrual care in general but not practice safe, evidence based practice.

1.2.2. Structural Challenges

Bangladesh university campuses tend to have insufficient menstrual supportive facilities. In a countrywide school survey, lack of special change rooms was notably associated with higher menstruation related absenteeism (Alam et al., 2017). Although less evidence exists for university settings, anecdotal data and more general WASH surveys indicate comparable shortcomings in toilets, soap or private WASH facilities in most female washrooms. Economic barriers also contribute to the issue. Even theoretically aware students will opt for cloth or some other unsanitary alternative because commercially available sanitary products are expensive, limited by limited pocket money or difficult to purchase without exposure or shame. In short, awareness is not enough to drive safe practice where structural and economic constraints exist.

1.2.3. Research Gap

Most menstrual hygiene research in Bangladesh focuses on school girl adolescents leaving university going especially those in tertiary level education. Despite Siddique et al. (2023) addressing young adult females, there is a lack of clear study on university female students in both public/private and urban/rural domains. University-aged adults possess unique autonomy, mobility, and institutional accountability challenges unlike those in adolescence. Closing this gap is important to inform context-relevant interventions and policy responses among this influential group.

1.3. Rationale and Significance

1.3.1. Health Implications

Poor menstrual hygiene goes from an acute discomfort to severe long-term reproductive health outcomes. A number of case-control studies suggest that using unhygienic material, such as old rags, and open disposal methods are associated with increased risks of CIN and cervical cancer (Bhoi et al., 2023). Improper menstrual hygiene has also been linked with higher reproductive and urinary tract infections among women that could further result in chronic complications and likely infertility (Knowledge of female hygiene, 2023; healtholer health articles). One broad epidemiological study among pregnant women in Cameroon found that the most prevalent reason for bacterial vaginosis was a lack of menstrual hygiene, and it afflicted over 80% of women with unsatisfactory hygiene behavior. Taken together, these findings emphasize that poor menstrual hygiene undermines long-term reproductive health.

1.3.2. Educational and Economic Impact

Poor menstrual hygiene damages educational performance and economic prospects. In Bangladesh, between 41% of adolescent girls stay away from school when menstruating because of poor facilities and hygiene measures. Among rural schoolgirls those with good menstrual hygiene practices were highly likely to have increased academic attainment compared with schools with poor practices (Ahmed et al., 2021). Specifically, "good" and "average" menstrual hygiene practice increased the likelihood of receiving $\geq 60\%$ marks by 5.7 and 2.9 times, respectively. Not only do these interruptions lower academic achievement, but they might thwart long-term career progress and economic independence.

1.3.3. Gender Equity

Misinformation & stigma surrounding menstruation counteract gender equality by entrenching discrimination against women and girls. When menstrual health is stigmatized, girls lose out on education and women face psychosocial barriers to their participation in public life. Addressing misinformation and stigma surrounding menstruation falls under Sustainable Development Goals: SDG 3 (Good Health and Well-being), SDG 4 (Quality Education) and SDG 5 (Gender Equality). Empowering women through knowledge, normalizing conversation and availability of menstrual products reaffirms their dignity and advances gender equality.

1.3.4. Policy Relevance

Robust evidence of this research has strong policy implications towards both university health & gender-responsive educational policy. Showing the association between menstrual hygiene, health risks and absenteeism can lend support to advocating for campus interventions, such as offering free or low-cost menstrual products, improving WASH facilities (having sanitary disposal bins, clean toilet facilities, access to water) and having menstrual health workshops. School-based early intervention experiments have shown that facility & education improvements reduced stigma, increased the hygienic activities rate and lowered self-reported rates of absences by as much as 8 percent (BMC Public Health, 2022). These results show that policy based, campus-level interventions can yield measurable returns for the health, academic engagement, and gender inequalities of students.

1.4. Research Objectives

Primary objectives.

- o To assess the level of knowledge regarding menstrual hygiene management among female university students in Bangladesh.
- o To identify prevalent menstrual hygiene practices adopted by university-studying female students.
- o To identify preferences and factors influencing the use of menstrual hygiene products.
- o To explore the association between knowledge and practices of menstrual hygiene among respondents.
- o To count the barriers and challenges that students face in maintaining proper menstrual hygiene.

Secondary objectives.

- 1.To determine & rank the major sources of menstrual information (family, peers, internet/social media, health workers) & to determine each respondent's perceived reliability for the various sources, thereby clarifying misinformation channels and potential for targeted education (Siddique et al., 2023; UNFPA, 2023).
- 2.In order to find socio-cultural and economic barriers like stigma, period poverty, price of commercial products and privacy restrictions that limit adoption of suggested menstrual practices and to quantify their relative contribution to poor hygiene (Kaur, Kaur, & Kaur, 2018; Das et al., 2015).
3. To compare KAP and barrier profiles by demographic strata (public vs. private schools, urban vs. rural source, year of schooling and wealth quintile) and to identify statistically significant contrasts to inform equity-oriented interventions (Siddique et al., 2023; MPNS-

36 validation studies).

1.5. Research Questions

Baseline Knowledge of Menstrual Hygiene among Female University Students

University going female in Bangladesh have satisfactory to good theoretical knowledge about menstruation (the majority know what menstruation is and normal hygienic practices), but acute practical knowledge gaps are present specifically with respect to infection risk issues (RTI/UTI correlation), how to properly clean/handle reusable products, optimal frequency of absorbent change and proper disposal. Education level and student status are both positively associated with higher knowledge scores but knowledge does not necessarily lead to safe behaviors due to intervening structural (WASH) and economic barriers. (See Siddique et al., 2023; UNFPA Bangladesh, 2023; national survey analyses.)

Evidence & detail (what the literature shows):

Measured knowledge is moderate but not stable. One large recent cross-sectional survey of early reproductive aged Bangladeshi women (mean age ≈ 23 , with a high proportion of students) had moderately high mean practice and knowledge scores, but highly variable by education, family status, menstrual regularity and region higher education was correlated with increased KAP scores. This reveals that students and more informal sources of information are more common. Mothers, sisters & friends are the most common information sources listed by UNFPA Bangladesh study and a number of national analyses; social media and the web are on the rise but have a tendency to offer incomplete or misleading technical counsel. Relying on these informal sources is responsible for recurring myths. (UNFPA Bangladesh report, 2023).

Specific knowledge gaps repeatedly reported:

Infection risk: The vast majority of young girls are not aware of how poor menstrual hygiene can increase the risk of urinary tract infection, bacterial vaginosis or reproductive tract infection or how (e.g., prolonged use, poor washing/drying of reusable cloths, poor hand hygiene). Several clinical and epidemiological studies find an association between unhygienic practices (e.g., reuse of unwashed cloths) and higher odds of urogenital symptoms or definite infection. (Das et al., 2015; reviews).

Product care (reusable cloths): The majority of cloth users do not follow recommended washing (soap, hot water) & sun-drying habits; drying indoors (shade) prevents UV sterilization. (Kaur et al., 2018; UNFPA Bangladesh).

Frequency of change: A significant percentage of respondents rarely change absorbents (most studies report high rates changing pads every 4–6 hours or leaving items on for extended periods), which raises risk of infection.

Disposal awareness: Students suffer from poor awareness of appropriate modes of disposal; in public/university environments absence of waste bins leads to flushing/shoving pads or wrapping + open disposal unhygienic as well as environmentally destructive practices. (Kaur et al., 2018; global reviews)

Quantitative indicators (from Bangladesh and similar LMIC studies):

- National surveys (MICS/other) show that ~24–37% of women use only commercial sanitary pads (estimates vary by dataset, rural/urban and year); the majority use cloth or mix. Where there is a university or higher education, use of pads is higher but cloth remains common among lower-income students or in rural areas. (Siddique et al., 2023).

1.6. Limitations

Despite efforts to employ rigorous methodology, this study presents several limitations that should inform interpretation & future research.

- **Self-reporting and social desirability bias.**

Participants may over report desirable menstrual practices (e.g., frequency of pad changing, handwashing) & underreport less socially acceptable practices due to social desirability bias a phenomenon extensively reported in self-reported health behavior studies (Fisher, 1993; Nederhof, 1985). Online and anonymous modes can reduce this bias but not eliminate it (Holbrook, Green, & Krosnick, 2003; Kawulich, 2005).

Researchers propose techniques such as indirect questioning and anonymity promises to mitigate this issue (Tourangeau & Yan, 2007).

- **Cross-sectional design and causality limitations.**

Cross-sectional design can establish menstrual hygiene knowledge, practice & determinants' association at one particular time but can't establish causality or temporality (Ilomäki & Tolppanen, 2019). Cross-sectional design is extremely prone to reverse causality and confounding, limiting inferential potential (Reddit epidemiology discussion).

- **Interviewer effects on sensitive topic reporting.**

Interviewer gender, ethnicity or attitude may indirectly influence answers given by participants especially on stigmatized or sensitive topics like menstruation. Interviewer gender had a significant impact on reporting styles in maternal health surveys (Vollmer, Singh & Valadez, 2021) & interviewer effects were reported for sensitivity to gender-based violence questions (Fieldworker effects, NFHS data). Keeping interviewers homogenous by gender and well-trained is likely to reduce such bias.

- **Under-representation of marginalized subgroups**

While it targets varied universities (public & private; urban & rural) the study may nevertheless under represent disadvantaged groups such as low-income, rural or students with disabilities due to obstacles in participation. This may limit generalizability and obscure structural inequities for the most disadvantaged.

Chapter 02: Materials & Methods

2.1. Methodology

2.1.1. Study Design: A cross-sectional, knowledge-attitude-practice (KAP) survey design was employed in this study. In a cross-sectional design, data on exposure and outcome are collected at a single time point without manipulating variables [1]. Such designs are often employed to establish the prevalence of knowledge and practice in a defined population, and are relatively quick and inexpensive [2]. By testing the students in one survey, we get a "snapshot" of menstruation practices and knowledge but cannot say anything about causal relations [3]. The KAP model guided our questionnaire: we examined respondents' knowledge (factual knowledge about menstruation and hygiene), attitudes (menstruation-related beliefs and perceptions), and practices (actual hygiene behavior). For example, Siddique et al. (2023) conducted a similar cross-sectional KAP survey among Bangladeshi women with a convenience sample of 1,214 female respondents (mean age ≈ 22.9) and a semi-structured questionnaire with knowledge (6 items), attitude (7 items), and practice (6 items)[4]. In the current study, questions in the survey were pre-tested and closed-ended to ensure clarity. This design allows us to estimate the prevalence of hygienic practices and good knowledge, and relationships between demographic variables and outcomes. We are aware that, in all cross-sectional designs, the temporality is not resolved; however, these types of surveys are very appropriate for the initial needs assessments and generation of hypotheses for future studies[2][4].

2.1.2. Study Population: 258 responses were collected from female university students undertaking studies in various fields. 89 respondents were from Health Sciences, 39 were from Arts, 38 were from Business Studies and 92 were from Other Science disciplines. These numbers are a balanced distribution of participants from various areas of study to grasp menstrual hygiene awareness and practices as they vary with various fields of study.

2.1.3. Sampling Method: For pragmatic reasons, a convenience sampling technique was adopted. We distributed the questionnaire via an online link to student mailing lists and social media groups, rather than employing probability sampling. We attempted maximum diversity by inviting students from different faculties (health, arts, science, and business) and private and public universities, but the ultimate selection was by willingness to respond. Convenience sampling is not rare for KAP surveys when funds are limited: e.g., Siddique et al. (2023) also used convenience sampling to recruit 1,214 women respondents from several cities [4]. Nonetheless, Hassan et al. (2025) achieved a representative sample (n=625) by using multistage cluster sampling across eight university campuses [7], but that was logistically beyond our resources. Acknowledging potential bias, we nevertheless justified the sample by pursuing breadth: the total N=258 responses, within the range of published cross-sectional KAP studies (generally 200–1,200)[4][7].

To introduce some representativeness, we stratified by year and faculty: i.e., we ensured that we had health science students (n=88) and arts, business, and other science students. Although not strictly random, this quasi-stratification meant that the sample reflected a range of academic backgrounds. The sample size of 58 was partially motivated by survey response: we attempted to survey at least ~300 students, aware that Cochran's formula (95% confidence, 5% margin, $p=0.5$) would suggest an optimum ~384. Constrained by time and access, however, we had 258 usable responses. In spite of this, the size is similar to most similar KAP surveys, i.e., Sankaran et al. (2024) surveyed 484 college students using an online questionnaire [8]. Our sample is thus sufficient for descriptive analyses and for detecting moderate associations, although statistical power for small effects may be limited.

2.1.4. Data Collection: Data were collected through a fixed, self-administered Google Forms questionnaire. The survey instrument was constructed with closed-ended questions on demographics and all primary variables (knowledge, practices, product usage, disposal practices, and barriers). Google Forms was used because of ease of use and automatic data collection. Specifically, online survey software can automatically format responses in an analyzable form [9] and can increase response rates by allowing participants to respond at their convenience [9]. As shown in a prior study, "the Google forms application ... was used

for designing and developing web-based questionnaires" and the survey link was "sent to students reached through social networking sites"[10]. Similarly, our survey link was distributed via university email lists, WhatsApp and Facebook groups of female students. Informed consent was sought before data collection began: an introductory section explained the study purpose, voluntary participation, and confidentiality. Only if they agreed ("I consent") could participants continue. As one comparable study outlined, "following informed consent, data collection was carried out using a pre-structured ... questionnaire"[11]. Responses were saved automatically in Google Sheets, minimizing data entry errors.

2.1.5 Reliability: To assess the internal consistency of the survey, we will compute Cronbach's alpha for multi-item scales (i.e. practice scale, knowledge scale). Cronbach's alpha is a standard reliability metric: values ≥ 0.70 are generally acceptable [13]. For example, KAP instrument developers recommend that a Cronbach's α of 0.7 or higher indicates good internal consistency [13]. If any subscale falls below this, we will examine item-total statistics to identify poorly functioning items. (Pilot studies of the questionnaire will permit preliminary Cronbach's calculations; final survey data will provide final reliability estimates.)

2.1.6. Data Analysis: Collected data were processed using the support of Microsoft Excel. The dataset was cleaned, coded and organized before proceeding with statistical analysis. Descriptive statistics in the manner of means, standard deviations (SD), frequencies and percentages gave an overview of the important variables and gave a glimpse of the characteristics and replies of the participants. Variable-by-variable examinations with the support of Excel identified trends and patterns among the respondents for knowledge scores, product preferences and hygiene practices.

2.1.7. Ethical Considerations: There were stringent ethical guidelines. The survey was fully voluntary and anonymous. We obtained informed consent from all respondents: the survey introduction articulated the aim of the study, assured anonymity, and stated that continuing beyond the consent page implied consent. For example, earlier studies in this field clearly articulate "after having been given informed consent, data collection was conducted"[11]. No identifiable information (student names, numbers) was collected, and information was stored securely with access restricted to the research team. We maintained confidentiality by using aggregate data and reporting grouped results. These procedures comply with human-subjects research ethical requirements (e.g. implicit consent in an internet setting, anonymity in survey research) and with similar studies in Bangladesh that maintain participant consent and data confidentiality [12][11]. In short, all the participants were adults (≥ 18) who consented to the anonymous questionnaire, meeting ethical research practice standards.

Chapter 03: Results

3.1. Survey Results on Menstrual Hygiene among University Students

We surveyed 258 female university students (mostly aged 18–25, from largely urban locations) in four faculties: Health Science (n=89), Arts (n=39), Business (n=38), and other sciences (n=92). Similar to international evidence of MHM research, the majority had received some menstrual education far more than the 6% of Bangladeshi schools providing hygiene in general. In our survey, 71% of Health Science, 60% of Business, 66% other science, but only 56% of Arts students had indicated that they were given formal menstrual hygiene education in school or college. Mothers were overwhelmingly the most common source of information about menstruation (around 65–75% in each field), followed by friends, sisters or teachers far less often. Almost 90% of those responded were familiar with appropriate disposal methods for pads, and an equal proportion ($\approx 90\%$) indicated awareness of environmental impact of disposal (via social media, reading, etc.), though $\sim 10\%$ still "don't know" about them. Most students reported being at least moderately comfortable speaking about menstruation (over 85% in all groups), suggesting reduced personal stigma. Surprisingly, however, a majority minority reported having suffered discrimination on the basis of menstruation (32% of health students, 33% of arts, 29% of business, 20% of other science). This is proof of existing cultural taboos: as was discovered by global agencies, taboo and discriminatory social norms about menstruation can lead to unsafe practices and shame.

Table 1: Distribution of Respondents by Academic Discipline, Location and Level of Study

Discipline	Number of Respondents (%)	Location		Level of Study	
		Urban(%)	Rural (%)	Undergrad (%)	Postgrad (%)
Health Science	89 (34.50%)	85 (34.55%)	4 (33.33%)	79 (37.44%)	6 (15.79%)
Arts	39 (15.12%)	35 (14.23%)	4 (33.33%)	23 (10.90%)	12 (31.58%)
Business Studies	38 (14.73%)	37 (15.04%)	1(8.33%)	26 (12.32%)	11 (28.95%)
Science Other than Health Science	92 (35.66%)	89 (36.18%)	3 (25.00%)	83 (39.34%)	9 (23.68%)

Table 1 presents the number of respondents by area of study, location and year level. As mentioned earlier there were 258 female students taking up a university degree who participated in the survey divided into four broad areas of study: Health Science (n = 89), Arts (n = 39), Business Studies (n = 38), and Science other than Health Science (n = 92).

Across all disciplines, the respondents were overwhelmingly urban-dwelling, accounting for 85 out of 89 in Health Science, 35 out of 39 in Arts, 37 out of 38 in Business Studies, and 89 out of 92 in Science except Health Science. It indicates that the survey sample was extensively urban-dwelling, reflecting the density of universities and schools within urban areas of Bangladesh.

In relation to the study level, most of the participants were undergraduate students who were 79 in Health Science, 23 in Arts, 26 in Business Studies, and 83 in Science other than Health Science. Fewer were postgraduate students, each constituting 6, 12, 11 and 9 individuals from the above study areas.

Overall, the data portray a discipline even, urban-dominated undergraduate representation. This distribution allows for a sufficiently diverse yet contextually consistent sample in examining menstrual hygiene practice, knowledge, and preference among female university students in Bangladesh.

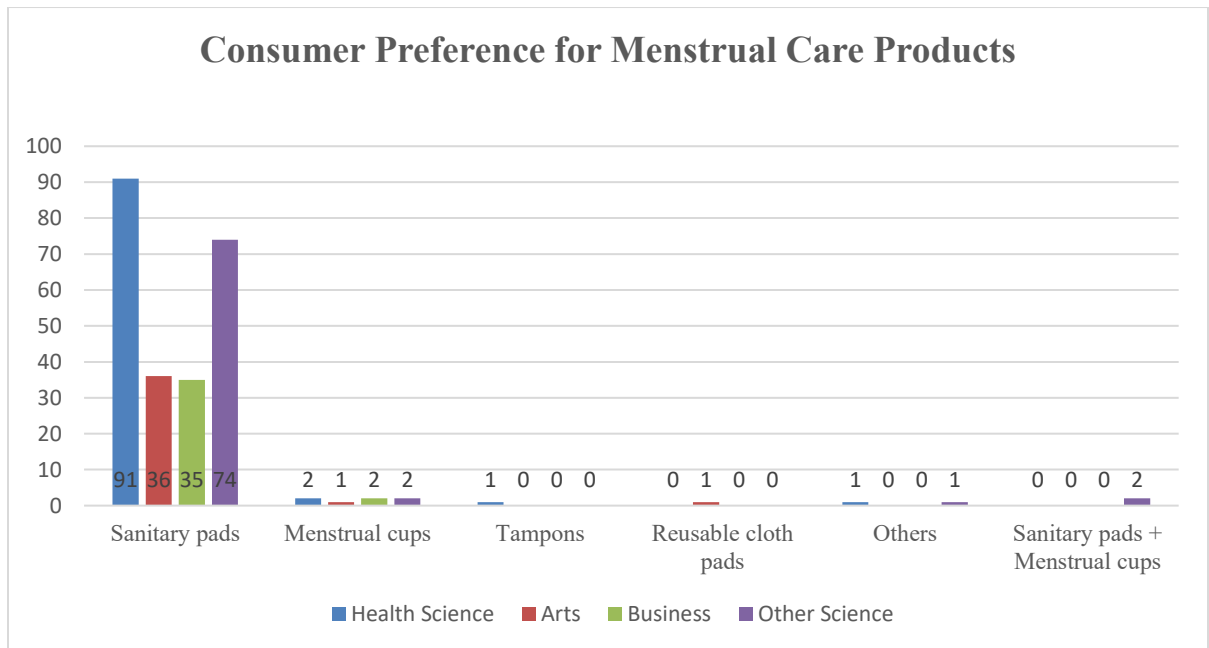


Figure 1: Consumer Preference for Menstrual Care Products

Knowledge Sources & Education: In all disciplines, mothers were the initial informants (e.g. 61 of 89 Health Science students). School teachers were initial informants for just 2–3%. Formal curriculum coverage was mentioned by a majority (60–71%) except for Arts students (56%). This is Different from an earlier Bangladeshi survey which identified that only 36% of girls had any Prior knowledge of menstruation before menarche. The greater formal education amongst our older students likely demonstrates university-level awareness programs.

Awareness about Hygiene: Almost all the respondents (84–96% across faculties) knew how to dispose of pads in a hygienic manner, and 88–92% had at least heard of the environmental impact of their improper disposal. A small proportion (8–11%) said "I do not know" to such impacts. About half reported experiencing menstrual problems (cramps, irregularity, etc.), and about 40% of Health/Other science students were seeking remedies or medical care for them. About 40% of Health and Other science students had attended a menstrual health workshop or seminar (only roughly 23% of Arts students had).

3.2. Product Usage (Overall and by Segments)

Use was sanitary pad dominated near to the exclusion of alternative methods. In all segments combined, ~95–97% of respondents used only disposable sanitary pads during menstruation; very few used alternatives (cloth, cups, tampons) in isolation or together. For example, 85 of 89 Health Science and 37 of 39 Arts students used exclusively pads. This near universal pad use is higher than rural adolescent rates (~55%) reported in Bangladesh, as a manifestation of our university/urban sample's greater access and take-up.

Product Choice: Comfort was the key driver of product choice. 67–79% of all faculties cited "comfort" (softness, ease) as a reason by our count. Availability also ranked highly: over 50% reported that market availability was an influence. Health benefits (e.g. hygiene) and word of mouth from others (friends/family) were cited by around 20–40%. Cost was an influence for a minority (about 20–25% in Health/Other science) but remain considerable. These outcomes are consistent with previous studies: rural students cited high price of pad as limiting for 11% of non-users. In our data, only 4 individuals expressed they would totally refuse environmentally friendly products, indicating responsiveness if other requirements are met.

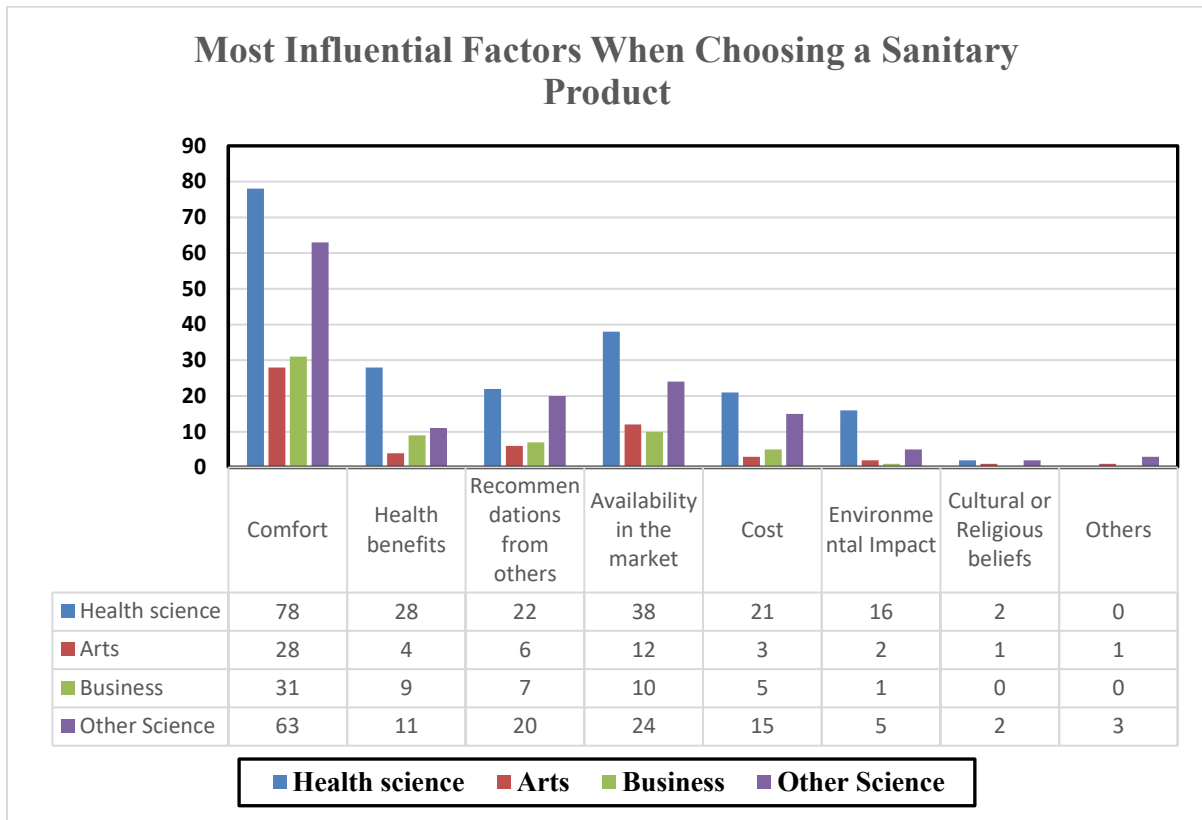


Figure 2: Most Influential Factors When Choosing a Sanitary Product

Product Preferences: In all fields, students quite simply want better sanitary products. Around 50–65% in both groups suggested sanitary pads had to be more absorbent, leak-proof, cheaper, or made from "eco-friendly" material. (In Health Science, e.g., 71% wanted "eco-friendly" material and 70% wanted to be less absorbency-improvement-conscious). If biodegradable "eco-friendly" products are available, the main encouragement for using them would be lower cost and wider availability (each mentioned by ~60–65% of students), followed by good word of mouth and healthcare professional approval (mentioned by ~40–50%). Only 1–3% of the students in each group reported that they would never purchase an eco-friendly product.

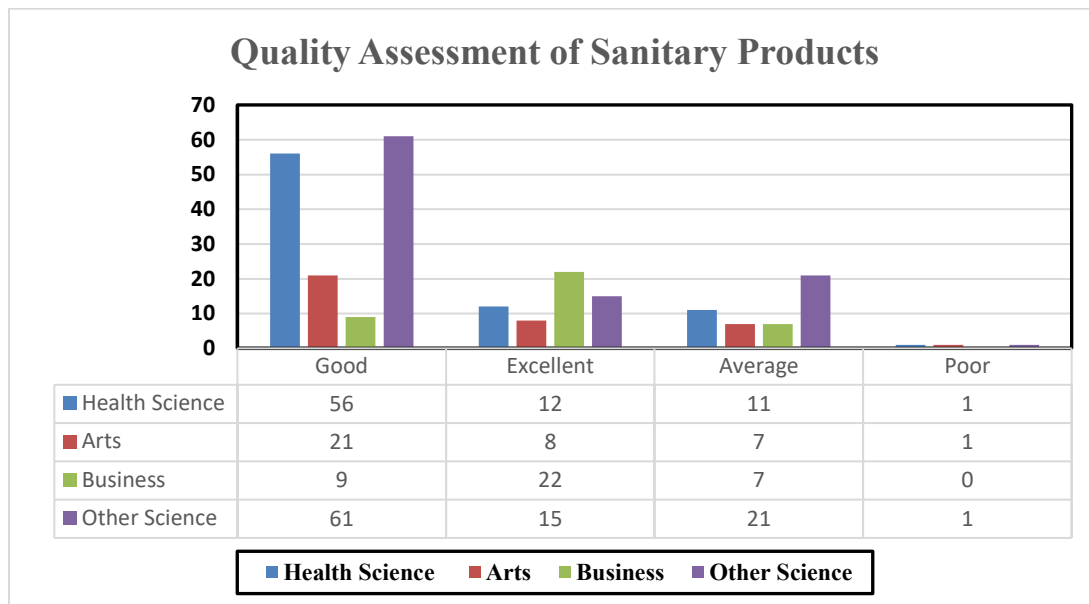


Figure 3: Quality Assessment of Sanitary Products

3.3. Disposal Practices

Nearly all respondents dispose of used pads by wrapping and throwing them in the trash (typically in covered garbage bins). Pooled across faculties, around 94–97% indicated "wrap and throw in trash." Less than 5% indicated burning pads or flushing them. For example, just 2 Health Science students and a handful of others indicated burning or flushing. This parallels reports of not using formal sanitary bins: one study found only 1.6% of rural Bangladeshi girls practiced bin disposal. Our results show that, as with those adolescents, most students practice simple trash disposal. (This has environmental consequences: used pads can pollute soil and water.)

By Segments: This figure presents the menstrual product disposal practices of female students from four academic disciplines. For all groups, about 95% reported wrapping the used products and disposing of them with the general trash. A small percentage (<5%) mostly from the Arts and Other Science groups reported other methods such as burning or

other means of disposal. No group reported a significant incidence of sanitary product flushing. These results indicate consistent and established disposal practices; however, these data highlight the need for better on-campus waste management infrastructure, such as providing sanitary bins in restroom facilities.

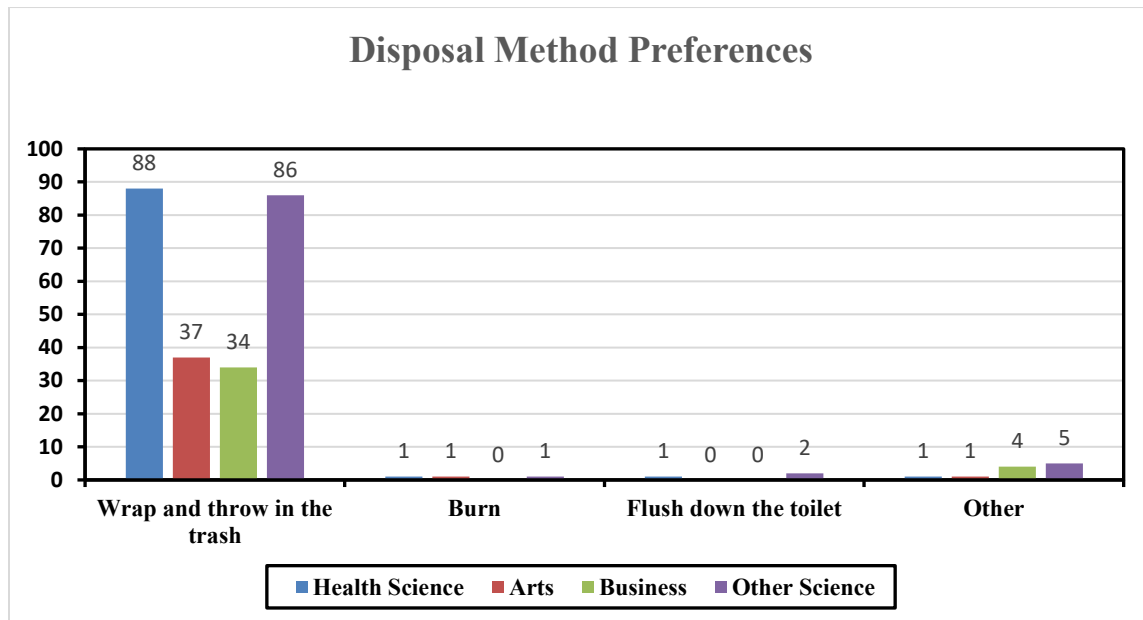


Figure 4: Disposal Method Preferences

3.4. Hygiene Consciousness and Practices

Figure 5 shows the prevalence of various menstrual hygiene practices among female university students from four academic disciplines. Overall, most respondents practiced good hygiene during menstruation: large proportions of the Health Science (89%) and Other Science students (80%) responded that they changed sanitary products every 4–6 hours, suggesting high levels of knowledge of the recommended frequencies of changing these products. By comparison, 34% of students in both Arts and Business reported doing so,

perhaps indicating relatively lower adherence in non-health-oriented disciplines.

At the same time, the habit of washing the genital area with clean water was consistently followed by 79% of Health Science and 64% of Other Science students, but considerably lower percentages were found among Arts respondents (28%) and Business respondents (27%). Similarly, 36% of students in Health Science and 28% in Other Science avoid going to public toilets during menstruation, which indicates a cautious attitude toward hygiene. Fewer students from Arts (13%) and Business (10%) reported avoiding public toilets during menstruation. Less than 1% of students in each category reported that they did not practice any specific hygiene behaviors, which suggests that most students in all disciplines practiced at least basic hygiene behaviors.

Overall, the data obtained demonstrate a positive trend in menstrual hygiene management amongst university students, especially among those studying health-related courses. However, the observed differences across disciplines strongly suggest a need for improved educational interventions in non-health curricula to enhance menstrual hygiene awareness and ensure consistent evidence-based practices for all students.

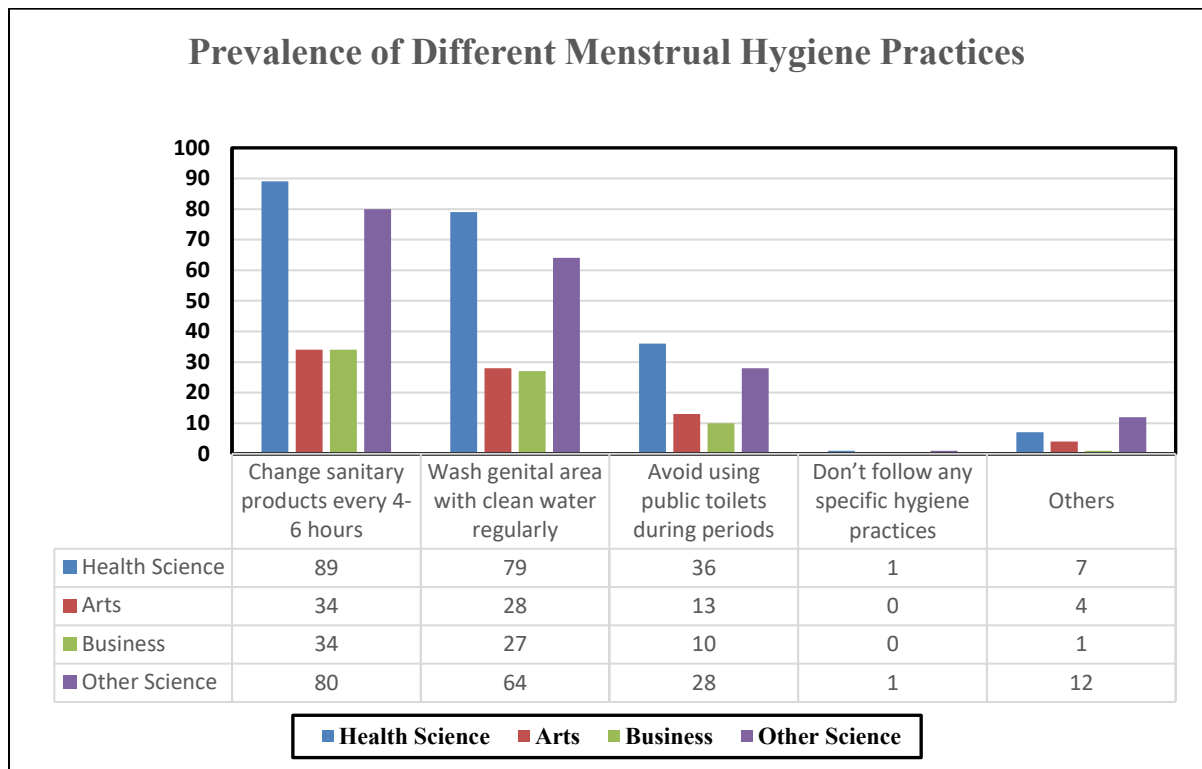


Figure 5: Prevalence of Different Menstrual Hygiene Practices

Workshops and Education: Whereas ~39% of Business students and ~40% of Health and Other science students had attended menstrual health seminars or workshops, only ~23% of Arts students had. It therefore appears that there is some latitude for further outreach, particularly among Arts. Interestingly, the vast majority of students from all three faculties felt at least fairly comfortable discussing menstrual matters-85-95%-indicating that individual stigma in university women is uncommon despite societal taboo.

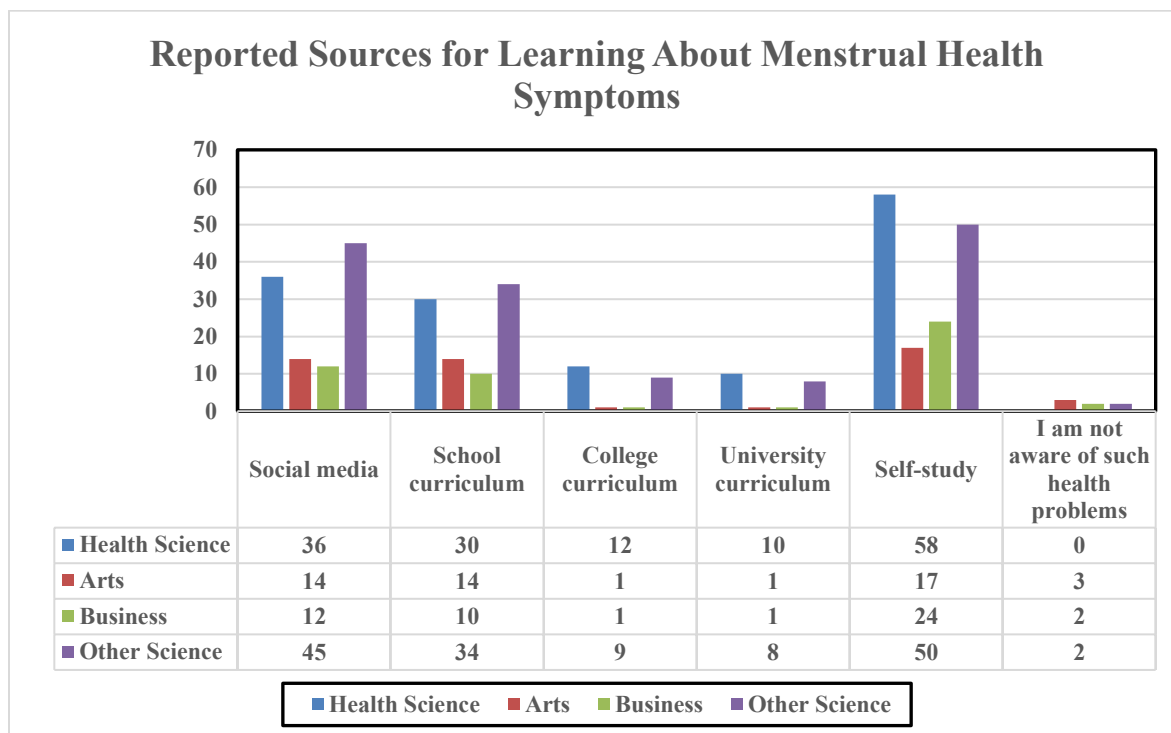


Figure 6: Reported Sources for Learning about Menstrual Health Symptoms

3.5. Barriers and Preferences

Students noted a variety of ongoing challenges and priorities:

Facility Support: Around 70–78% of the students reported that their campus provides some menstrual facilities/products. For instance, around 70–78% across all regions reported their university provided pads (free, subsidized, or at cost) or handed them out. However, 22–31% reported that there were no adequate facilities on campus. This means that around a quarter of the students do not even have elementary support (e.g. access to pads in clinic or restroom). Inadequate facilities are a documented disincentive to attendance at menstruation, so reported absence by many students may impact academic participation.

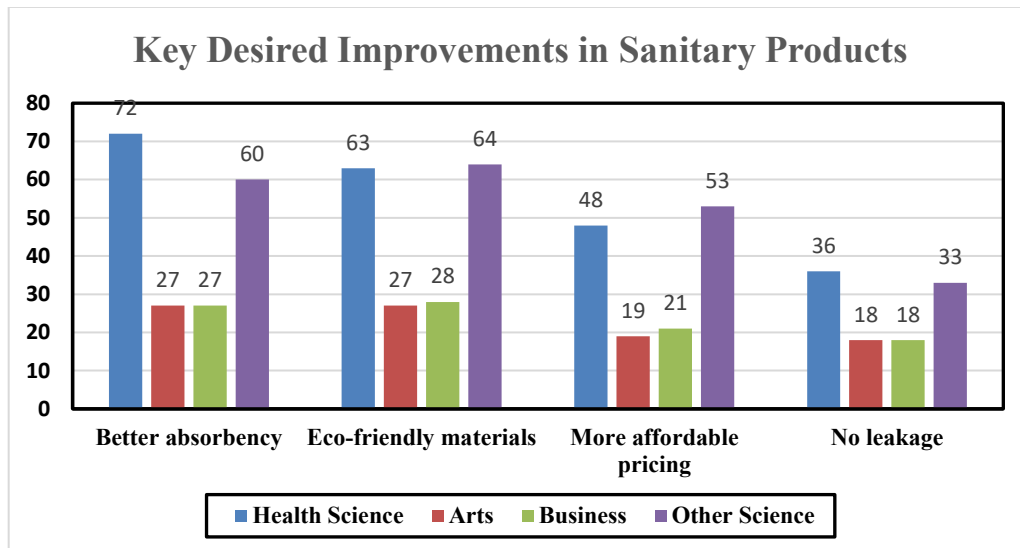


Figure 7: Key Desired Improvements in Sanitary Products

Stigma and Discrimination: As noted, approximately one-third of Arts and Health Science students (and ~25–30% of Business/Other science) reported discrimination (e.g. social restriction or teasing) during menstruation. This is evidence for ongoing stigma. World guidance warns that cultural taboos can result in shame and unsafe behaviors. In our sample, stigma appears less explicit (most students are willing to discuss), but still operates on a minority.

Government and Education: If asked to say how the government could help promote menstrual health, most of them recommended teaching menstrual education as part of school curricula, subsidizing or providing free sanitary products, and initiating awareness campaigns. (Students could choose multiple responses; the themes that emerged most frequently were education, cost, and public awareness.)

Product Improvement: Nearly all students also stressed product improvements. More than 50% in all Fields wished for better absorbency, no leak, reduced price, and ecologically friendly material in sanitary pads. This bears out comfort and cost emphasis identified above. If such ecologically friendly pads were made available, most ($\approx 60\text{--}65\%$) said reduced price and ease of availability would make them think about switching, with positive peer or health-professional recommendation also coming into play. Two students flatly rejected eco-pads.

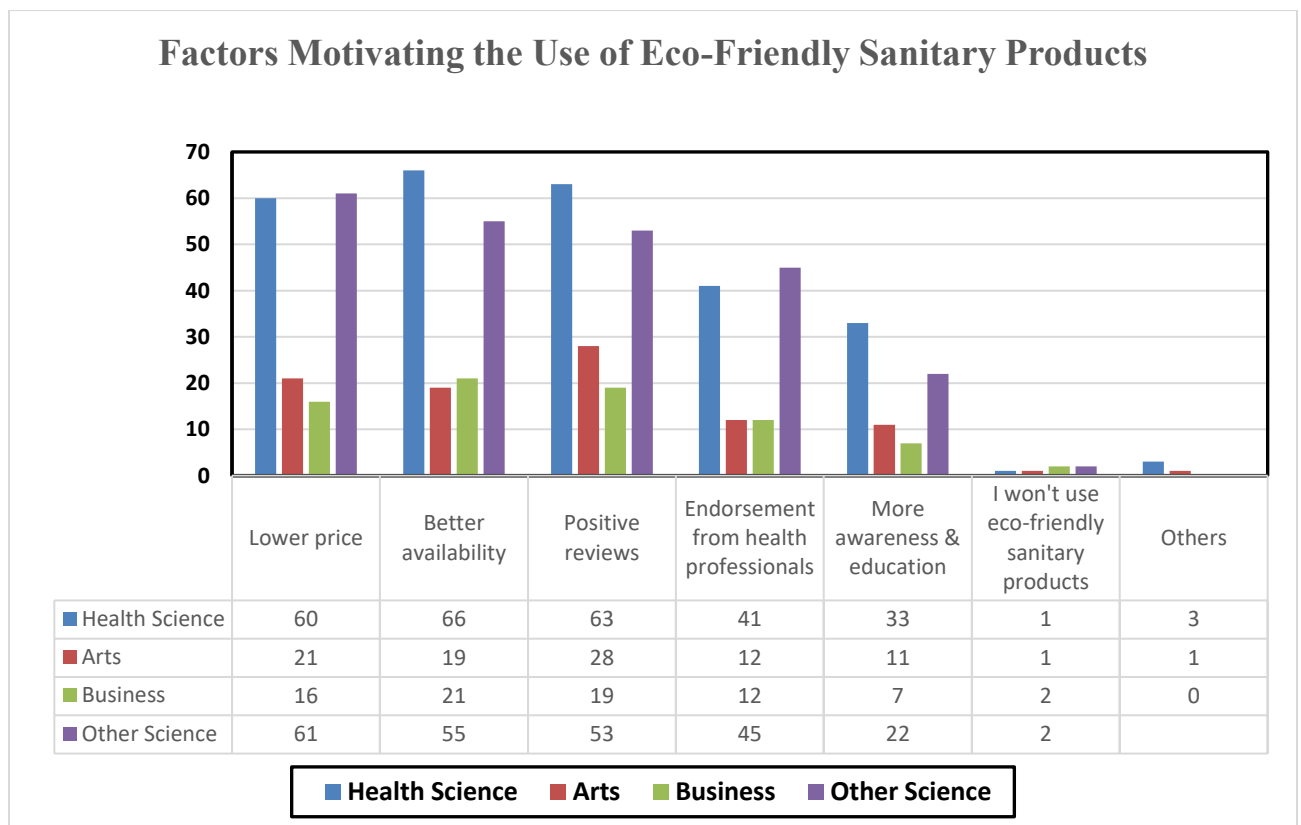


Figure 8: Factors Motivating the Use of Eco-Friendly Sanitary Products

To summarize, our survey indicates excellent overall awareness and hygiene behavior among these university students. Sanitary pads are nearly ubiquitous in use and most students change them frequently and appropriate them correctly. Cost concerns, campus facilities, and lingering stigma remain, however. These results ring true with global evidence: numerous girls and women continue to face economic and cultural impediments to ideal menstrual management. These must be tackled with education, subsidized products, better WASH facilities, and anti-taboo campaigns would most probably enhance menstrual health and contribute to gender equity in education.

Chapter 04: Discussion

Menstrual health is a key public health concern. Worldwide, approximately 52% of women are of reproductive age but it has been estimated that 500 million women do not have the resources or knowledge to safely manage menstruation. This is echoed in Bangladesh: a study in 2024 found that around 65% of adult Bangladeshi women use old cloths for menstruation. These unhygienic practices are one of the causes of school absenteeism and health risks. Hygiene practice, such as the use of pads, cups, and tampons, greatly reduces infection risk and days lost at work. Despite progress, deep taboos and educational gaps remain. For example, only 36% of Bangladeshi girls knew anything about menstruation prior to menarche, and only 6% of schools teach menstrual hygiene. Stigma remains rampant: often, women are discouraged even from discussing periods.

Response: We surveyed 258 students (mostly urban, undergraduates) at Bangladeshi universities in four disciplines (Health Science, Arts, Business, and Other Science). Mothers and female family members were by far the most common initial informants of menstruation (over 65% of respondents), echoing previous findings that women learn about menstruation from family members.

Knowledge & Education: Nearly all respondents ($\approx 99\%$) think that menstrual hygiene should be taught in school, mirroring the recognized need for formal education. Participants learned about menstrual health primarily from school/college curriculum or social media, but less so from university courses. This mirrors calls for early introduction of menstrual education: community guidelines recommend "leveraging education, open communication, and inclusion of menstrual health information in school". Only a minority ($\approx 1/3$) had ever participated in any menstrual health workshop.

Comfort & Stigma: A majority of respondents were comfortable (moderately or very) discussing menstruation (Health: 100% comfortable, Arts/Business: $\sim 95\%$ comfortable), yet discrimination remains frequent. Period stigma was experienced by $\sim 30\text{--}36\%$ of students in Health/Arts/Business (more in Arts), compared to $\sim 20\%$ in other fields. This reflects overall patterns of menstrual stigma in Bangladesh: girls routinely feel ashamed or must conceal

periods, exacerbating absenteeism. Open dialogue can help remove taboos. In our survey, the vast majority provided "education and "awareness" and "open discussions" as most crucial measures to remove stigma – the exact solutions that health advocates propagate.

Product Choice & Preferences: Almost all students ($\approx 95\%$) use commercial sanitary pads. Menstrual cup, tampon or cloth use was very low (only a few cup or cloth users). This contrasts with national data, in which cloth use is common, reflecting our urban, educated sample. When asked why they chose a product, the top reasons were comfort, followed by availability and perceived health benefits, then by price and cultural fit. Specifically, "comfort" was the most-mentioned factor by far across fields. Respondents rated their products as good or excellent.

Environmental Awareness: The majority of the students ($\sim 80\text{--}90\%$) reported that they had learnt about menstrual waste problems, usually by reading and through social media. Many showed interest in eco-friendly materials ($60\text{--}70\%$) and higher absorbency ($\sim 70\%$) of products, which voiced concern for sustainability. Indeed, experts warn that disposable pads create huge amounts of waste; they contain plastic and take 500–800 years to degrade. The government promotes the use of biodegradable products and the management facilities for such wastes; the NGOs promote the latter. In line with the above, our participants mentioned that they would be encouraged to use such eco-friendly products if these products are cheaper, more available, and endorsed by professionals or peers.

Hygiene & Disposal Practices: Menstrual hygiene practices were good among nearly all students: almost everyone changes pads regularly and washes properly. Over 95% wrap soiled pads and throw them in the rubbish. Few indeed flush or burn them. This high compliance is contrasted with the national situation: lack of disposal bins and stigma still lead most Bangladeshi women to dispose of used pads by flushing or concealing them. Most respondents were aware of correct disposal methods ($85\text{--}99\%$ across fields).

Recommendations

To address these issues, we suggest a multi-dimensional strategy following Bangladeshi and global best practices:

- **Awareness and Education Campaigns:** In-university menstrual hygiene education on a regular basis (through seminars, peer clubs and health centers) to dispel myths and impart practical information. As Siddique et al. (2023) emphasize, targeted interventions are required to close knowledge gaps. Programs must also involve male allies, to reduce stigma. Evidence shows that having a combination awareness with stigma reduction can improve learning outcomes: in one randomized program (Madagascar), a campaign and free products had measurable improvements in academics and reduced anxiety. Universities can also train "menstrual leaders" or peer educators. Sharing medically accurate information (e.g. about infection risk, pad handling, safe washing of cloth) will allow students to turn awareness into safe practice.
- **Free or Low-Cost Menstrual Products:** Provide low-cost or free sanitary products on campus. Either at public restrooms or health centers. Fiscal restraints are the issue at hand: studies demonstrate embarrassment and cost often act as deterrents to purchase. Subsidies for pads or vouchers (as many schools worldwide have implemented) can greatly increase use. Key here is encourage environmentally sound alternatives: e.g., distribute reusable cloth pads or menstrual cups. New evidence shows free distribution of menstrual cups greatly increases their use and has the potential end "period poverty". Universities can partner with NGOs (e.g. Safe pad Bangladesh) to supply reusable pads, which reduce wastage and future expense. Being able to purchase products from campus means students never miss a class because they lack the resources.
- **Improved WASH Infrastructure:** Improve on-campus facilities to facilitate menstrual management. This includes clean and lockable toilets with running water and soap in all women's bathrooms, plus designated bins for pads. A WHO/UNICEF document showed that globally only ~31% of schools Have menstrual waste bins – standards Bangladeshi

universities must exceed. Expenditure on proper plumbing (to avoid flush-induced sewer problems) and frequent waste collection will have a serious impact. Providing sanitary waste bins (or incinerators) in every female toilet ensures privacy and proper disposal. As found during one trial, enabling girls to control menstruation at school by enhancing dignity, water and sanitation can significantly reduce absenteeism. In our case, provision for 24/7 safe access to clean campus facilities is essential.

- **Fostering Sustainable Products:** Encourage the utilization of sustainable menstrual products and behavior. Besides pads, institutions can educate students on reusable options (cloth pads, menstrual cups) and safe laundry. Bins used for disposal of soiled pads can provide eco-friendly disposal (e.g. incineration or managed landfill) instead of plastic-filled bins. International research efforts report that when students learn about cost savings and environmental impacts, uptake of reusable alternatives increases. Campus "green health" programs can emphasize the long term reduction of waste and cost savings associated with reusable. Overall, coupling menstrual support with sustainability will encompass hygiene alongside environment concerns.

Chapter 05: Limitations and Future Research

5.1. Limitations

There were several limitations of this study that must be taken into consideration. Data were collected through self-report online questionnaires which may have had the potential to introduce social desirability bias and recall bias because the respondents could not always give completely truthful answers regarding their menstrual hygiene behaviors (Das et al., 2021; Siddique et al., 2023). Aside from that, the research was conducted only in the case of female university students, which limits the representativeness of results to the broader population of schoolgirls or women outside schools (UNICEF, 2022; Hennegan & Montgomery, 2016). The predominantly urban-based study sample also represents a limitation in terms of representativeness since rural respondents who often suffer from infrastructural, cultural and economic constraints were underrepresented (Jahan et al., 2022). In addition, cross-sectional study design gathers information at one moment in time and therefore cannot establish causation among menstrual hygiene knowledge, behavior, and determinants (Ali et al., 2020). Due to limited time and resources, the study did not have the complex inferential models such as multivariate regression or structural equation modeling that may have provided further insights on demographic and psychosocial determinants (Siddique et al., 2023). Despite these limitations, the study provides a useful empirical comparison on menstrual hygiene understanding and experience among Bangladesh's university-bound young women that contributes to the growing body of evidence to be used in future intervention and policy development.

5.2. Future Research

Several research directions can build on these findings:

Longitudinal Studies: Because our cross-sectional approach captures one point in time, future cohort studies are needed to track menstrual health and behavior over time. Longitudinal designs would allow assessment of how changes in awareness or facilities

influence health outcomes (e.g. rates of UTIs or attendance). As Ilomäki & Tolppanen (2019) note, only longitudinal or experimental designs can establish causality beyond associations. Following the same students across semesters could reveal how interventions (e.g. an awareness campaign) impact practices and wellbeing.

Interventions Trials: Solutions must be tested through rigorous intervention-based research. For instance, randomized or quasi-experimental studies could quantify the impact of introducing free pad dispensers, building disposal bins, and/or MHM education on campus. The model already exists in the Madagascar experiment, where schools randomly selected to receive hygiene infrastructure in addition to peer-led education saw significant improvements in attendance and menstrual practices. Similar trials in Bangladeshi universities will identify the most effective strategies to scale. Such research could also explore cost–benefit analyses for different interventions.

Qualitative and Mixed-Methods Work: Understanding the nuanced cultural context of Qualitative studies will be beneficial in studying menstruation at universities, such as focus groups and interviews. Insights into students' attitudes, stigma experiences and suggestions can inform tailored programs.

For instance, understanding why even health students may be reluctant to purchase pads could usefully inform destigmatization messages. Surveys could be complemented by field observations of campus WASH facilities.

Diverse Populations and Settings: Research should include students from varied disciplines (arts, sciences, business and other science) and locations (urban vs. rural campuses, public vs. private). This will clarify whether barriers differ by socioeconomics or region. Long-term, multi-site studies could build a comprehensive national picture of university menstruators.

By implementing these recommendations and pursuing future studies, Bangladesh can make substantial progress in menstrual health among young women. Such efforts will protect students' health, enhance their education, and advance gender equity.

Chapter 06: Conclusion

This is a descriptive cross-sectional study of 258 female university students in health sciences, arts, business studies and other than health science disciplines in Bangladesh reviewed the current state of menstrual knowledge, practices and preferences. Participants were highly informed about menstrual health a majority of the students correctly identified key aspects of menstruation and hygiene requirements. Most reported following recommended hygiene practices, such as using clean menstrual products and changing them at appropriate intervals, genital hygiene and proper disposal of used materials. Students specifically those enrolled in health-related programs demonstrated very good knowledge and regularly showed appropriate hygiene behaviors, reflecting the influence of their academic training. All groups showed substantive familiarity with the topic though students from non-health disciplines displayed slightly greater variability in knowledge and practice. About product preference, disposable sanitary pads are now the dominant usage pattern, consistent with the national trends for use, while a minority continued to use cloth or other reusable materials, often citing cost considerations or cultural habits. Despite these, although encouraging, some persistent challenges were indicated: many students identified financial constraints as a barrier to consistently affording their preferred menstrual products and poor campus facilities. Aside from that, limited private and hygienic restrooms, water and disposal bins impeded optimum menstrual management. Lingering social stigma and cultural taboos to menstruation also remained. It seemed apparent that certain participants felt embarrassed or would avoid discussing their needs about menstruation openly. Institutional support for menstrual health through educational efforts and campus amenities seemed uneven and often fell short of satisfactorily addressing the issues.

In sum, the study has pointed out that, overall, the knowledge of menstrual hygiene and practices among female university students in Bangladesh is relatively good and especially among those studying in health fields and infrastructural, economic, and Socio-cultural barriers remain. These are the gaps that need to be addressed in order to build on solid awareness at a baseline. Observed and ensured that all students can manage menstruation with dignity and confidence. Findings offer a clear baseline of the current strengths and weaknesses in menstrual health management among university students, providing useful insights to guide ongoing efforts to improve menstrual hygiene.

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