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Menstrual Hygiene Awareness and Management among Adolescent Girls: A Cross-Sectional Observational Study

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Abstract— Menstrual health is an important component of reproductive health and overall well-being among adolescent girls and young women. This study assessed menstrual health awareness, menstrual characteristics, and hygiene management practices among college-going girls. A cross-sectional observational study was conducted at Malineni Perumallu Educational Society between January and April 2026. Data were collected using a structured questionnaire administered through Google Forms after informed consent was obtained. Of 473 students who participated in the survey, 372 met the study criteria and were included in the analysis. Descriptive data were presented as frequencies and percentages. Among the participants, 44.1% were aged 20–21 years. Regular menstrual cycles were reported by 77.1% of participants, while 22.9% reported irregular cycles. Most participants (75.8%) reported cycle intervals of 21–35 days, and 52.3% reported menstrual bleeding lasting 4–6 days. Sanitary pads were the most commonly used menstrual product, and most participants reported changing pads every 2–4 hours. Academic stress was the most frequently reported stress-related factor affecting menstruation. The findings indicate generally satisfactory menstrual hygiene practices, but menstrual irregularities and stress-related disturbances remain important concerns. Comprehensive menstrual health education, stress management, appropriate healthcare-seeking behavior, and improved access to affordable menstrual hygiene products are recommended to support reproductive health among college-going girls.

Keywords: *menstrual hygiene; menstrual health; adolescent girls; menstrual awareness; reproductive health*

1. Introduction

Menstruation is a natural physiological process that occurs throughout the reproductive life of females from menarche until menopause. The menstrual cycle is regulated primarily by coordinated hormonal changes involving the hypothalamic-pituitary-ovarian axis and is closely associated with ovarian activity and endometrial preparation for potential pregnancy [1]. Menstruation may also be accompanied by physical and psychological symptoms, including abdominal pain, breast tenderness, mood changes, and food cravings. Abnormalities in menstrual patterns may occur in conditions such as dysmenorrhea, heavy menstrual bleeding, polycystic ovary syndrome (PCOS), and endometriosis, which can negatively affect quality of life and reproductive health [2].

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Despite being a normal biological process, menstruation remains associated with myths, misconceptions, stigma, and cultural restrictions in many communities. Limited access to accurate information before menarche may cause fear, embarrassment, confusion, and anxiety among adolescent girls [3]. Menstrual health therefore extends beyond the management of menstrual bleeding and includes access to accurate information, appropriate sanitation facilities, suitable menstrual products, healthcare services, and an environment that protects dignity and freedom from stigma and discrimination [4]. Evidence from low- and middle-income countries indicates that inadequate menstrual hygiene management can affect physical health, psychological well-being, participation in education, and social activities [5].

Menstrual hygiene management is influenced by several interconnected factors, including socioeconomic conditions, access to clean water and sanitation, availability and affordability of menstrual products, knowledge, cultural beliefs, and waste-disposal facilities. Inadequate menstrual hygiene practices and limited access to appropriate facilities may create barriers to safe and dignified menstrual management, particularly among adolescent girls [6]. Improving menstrual health consequently requires not only individual knowledge but also supportive educational and institutional environments that enable girls to manage menstruation safely and comfortably.

Previous studies have demonstrated that knowledge concerning menstruation and menstrual hygiene varies substantially across populations and educational settings. Adolescents may receive information primarily from mothers, relatives, peers, schools, or digital sources, while the quality and accuracy of such information may differ considerably [7], [8]. Systematic evidence has also indicated that menstrual hygiene management is associated with broader health and social outcomes, including school attendance, participation in daily activities, and emotional well-being [9]. In India, menstrual-related challenges may further influence educational participation, particularly when students lack adequate facilities, menstrual products, or supportive environments [10].

College-going girls represent an important population for menstrual health assessment because the transition into higher education is often accompanied by academic pressure, changing lifestyles, altered sleep patterns, and increased independence in healthcare and hygiene decisions. Menstrual cycle characteristics can provide useful information regarding reproductive health, while persistent abnormalities may require appropriate clinical assessment. Menstrual patterns are increasingly recognized as an important indicator of adolescent and young women's health, particularly when abnormalities are persistent or associated with other symptoms [11], [12].

Although menstrual hygiene has received increasing attention, studies that simultaneously examine menstrual characteristics, perceived stressors, menstrual product use, and hygiene management among college-going girls remain important for developing institution-based health education programs. The present study addresses this need by assessing menstrual health awareness, menstrual characteristics, stress-related factors, and menstrual hygiene management practices among college-going girls. The objective of this study was to describe menstrual patterns and hygiene practices in the study population and identify areas requiring improved education, supportive interventions, and appropriate reproductive healthcare.

2. Method

This study employed a cross-sectional observational design to assess menstrual health awareness, menstrual characteristics, stress-related factors, and hygiene management practices among college-going girls. The study was conducted at Malineni Perumallu Educational Society/Malineni Lakshmaiah Women’s Engineering College during a four-month period from January to April 2026. The study population consisted of female college students who had attained menarche and were willing to participate in the survey. The study was designed as a descriptive assessment of menstrual health-related characteristics

and practices rather than an intervention study.

A total of 473 students participated in the initial survey. Based on the study criteria and availability of complete information, 372 participants were included in the final analysis. Participants were college-going girls aged 18–22 years who had attained menarche and provided informed consent. Students who had not attained menarche, were outside the specified age range, were unwilling to participate, or were taking medication for menstrual disorders were excluded from the analysis. The final analytical sample therefore consisted of 372 participants.

Data were collected using a structured questionnaire developed to obtain information concerning menstrual characteristics and hygiene management. The questionnaire included questions regarding age, menstrual regularity, menstrual cycle interval, duration of menstrual bleeding, perceived stress-related factors, menstrual products used, sanitary pad replacement frequency, disposal practices, and premenstrual symptoms. The questionnaire was administered electronically through Google Forms. Before completing the questionnaire, participants were provided with an explanation of the study purpose and the information requested. Participation was voluntary, and informed consent was obtained before questionnaire completion.

The survey data were organized and analyzed descriptively. Categorical variables were summarized using frequencies and percentages. The analysis focused on describing the distribution of age, menstrual regularity, cycle interval, bleeding duration, stress-related factors, menstrual product use, and sanitary pad replacement frequency. The findings were subsequently interpreted in relation to previous evidence concerning menstrual health and hygiene management [13]–[15].

The participant selection process is presented in Figure 1. A total of 473 students participated in the initial survey, of whom 372 were included in the final analysis after application of the study criteria and assessment of participant eligibility.

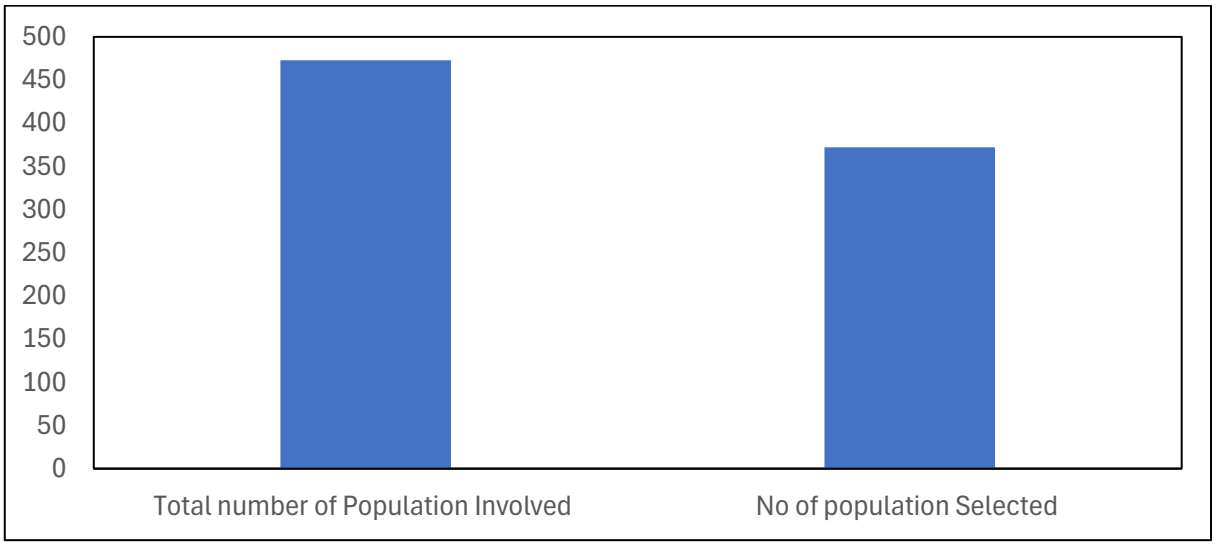

Figure 1. Participant selection and inclusion process

3. Results and Discussion

The demographic distribution of the participants is presented in Figure 2. Of the 372 participants included in the final analysis, 135 were aged 18–19 years, 164 were aged 20–21 years, and 73 were older than 21 years. Participants aged 20–21 years represented the largest proportion of the study population, accounting for 44.1% of the sample. The distribution indicates that the study predominantly represented late-adolescent and young adult college students, providing an appropriate population for examining menstrual health awareness and hygiene management in an educational setting.

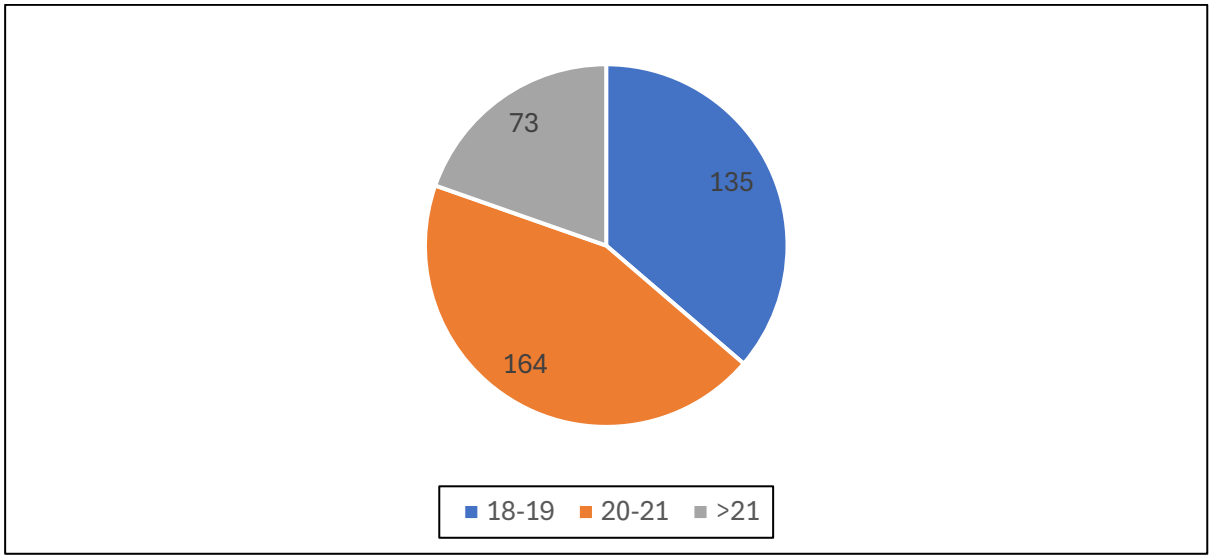

Figure 2. Age distribution of the selected study population

The menstrual regularity of participants is presented in Figure 3. Most participants (77.1%) reported regular menstrual cycles, whereas 22.9% reported irregular menstruation. The predominance of regular cycles suggests that most participants experienced relatively consistent menstrual patterns. However, the proportion reporting irregular cycles remains clinically relevant because persistent menstrual irregularities may be associated with physiological, endocrine, nutritional, lifestyle, or psychosocial factors. Menstrual irregularities should therefore be considered an important component of adolescent and young women's reproductive health assessment, particularly when abnormalities are persistent or accompanied by other symptoms [11], [12].

The distribution of menstrual cycle intervals is presented in Figure 4. Most participants (75.8%) reported cycle intervals between 21 and 35 days, while 9.8% reported intervals shorter than 21 days and 14.4% reported intervals longer than 35 days. The predominance of cycle intervals within the 21–35-day range indicates that most participants reported patterns broadly consistent with commonly accepted menstrual cycle ranges. Nevertheless, the presence of shorter and longer cycle intervals indicates that a proportion of participants experienced variations that may warrant monitoring and, when persistent or symptomatic, appropriate clinical evaluation. Menstrual characteristics can provide useful information regarding reproductive health and should be interpreted alongside other clinical and lifestyle factors [12].

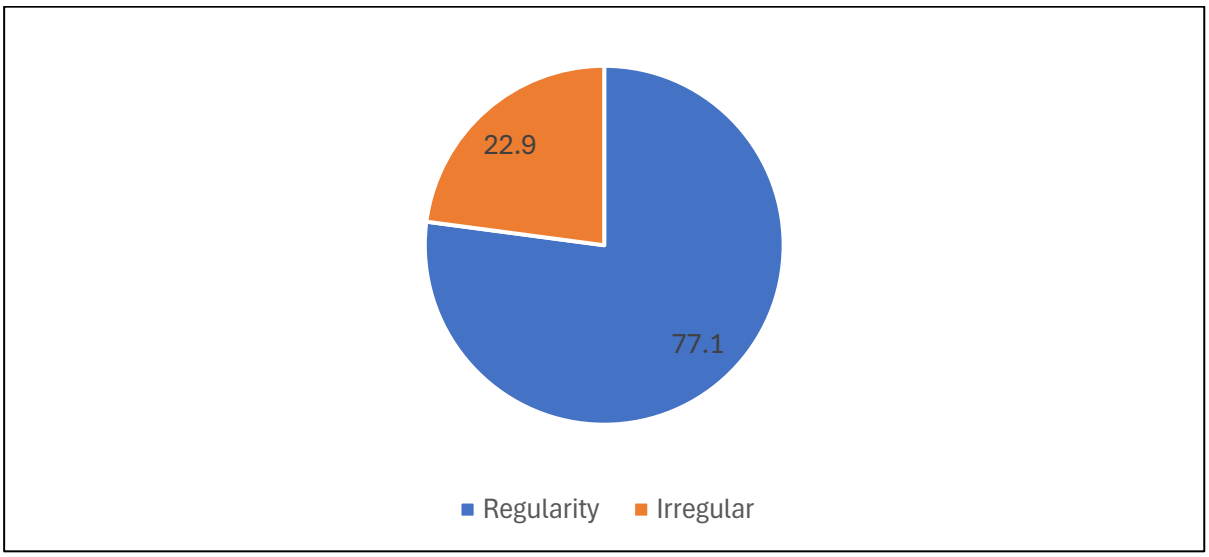

Figure 3. Menstrual regularity among the selected population

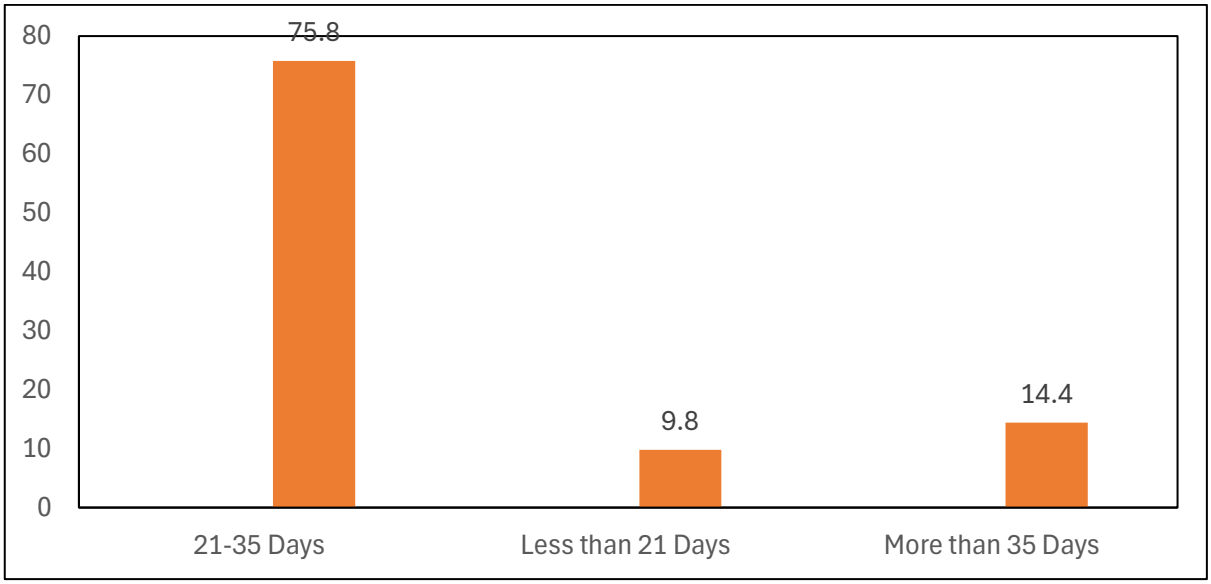

Figure 4. Menstrual cycle interval among the selected population

The duration of menstrual bleeding is presented in Figure 5. More than half of the participants (52.3%) reported menstrual bleeding lasting 4–6 days, while 41.8% reported bleeding for 1–3 days and 5.9% reported bleeding exceeding 7 days. The findings indicate that most participants experienced menstrual bleeding within a commonly observed duration. The smaller proportion reporting prolonged bleeding remains relevant because heavy or prolonged menstrual bleeding can affect physical well-being and may require further assessment depending on severity, frequency, and associated symptoms [3].

was the most frequently reported factor, accounting for 60.1% of responses, followed by personal stress at 25.7% and sleep deprivation at 14.2%. The predominance of academic stress highlights the importance of considering psychosocial and lifestyle factors when addressing menstrual health among college students. Psychological stress and disrupted sleep may influence hormonal regulation and may be associated with changes in menstrual patterns and premenstrual symptoms. However, because this study used a cross-sectional descriptive design, the reported stress factors should be interpreted as perceived associations rather than evidence of causal relationships. Stress-related factors perceived to affect the menstrual cycle are presented in Figure 6. Academic stress

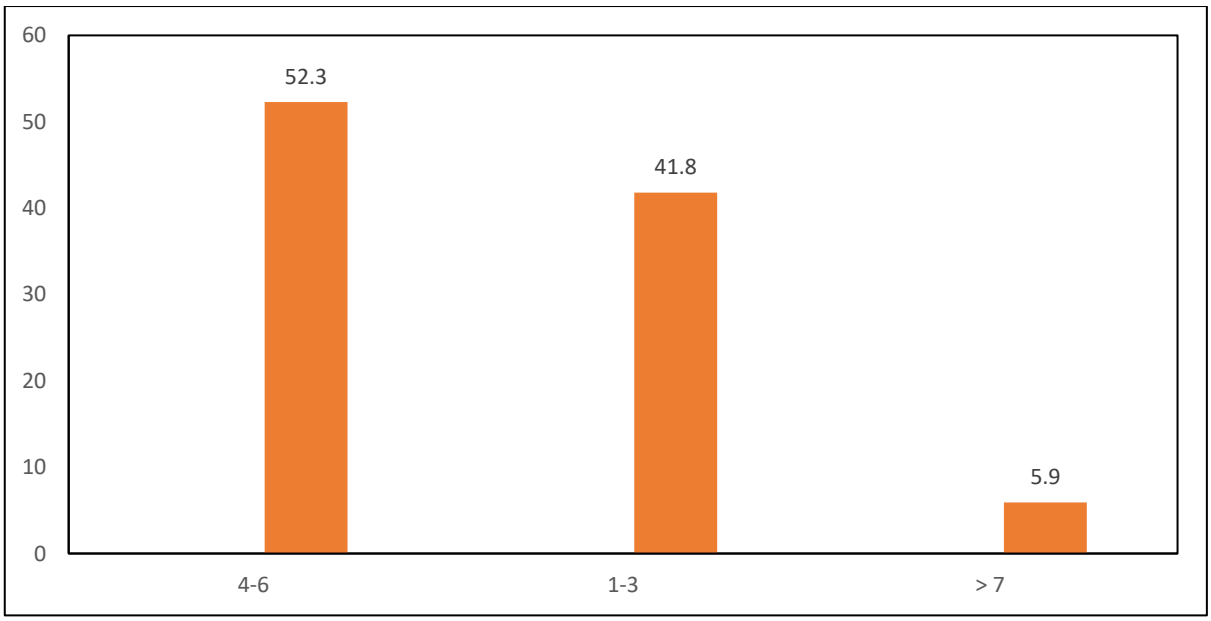

Figure 5. Number of bleeding days during the menstrual cycle

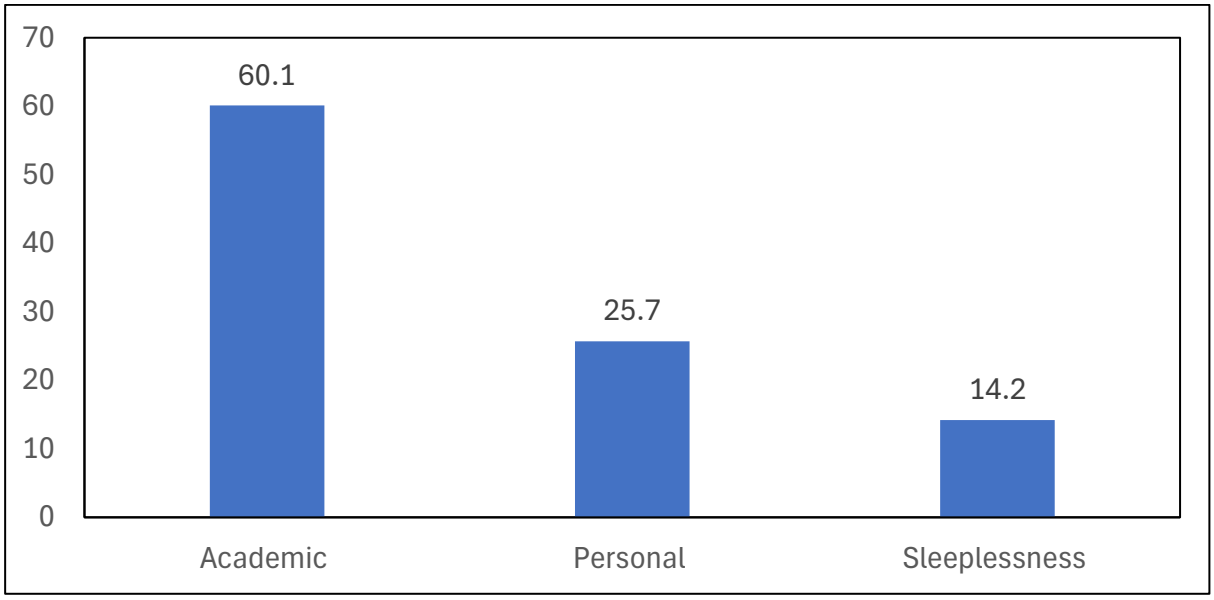

Figure 6. Stress-related factors perceived to affect the menstrual cycle

The use of menstrual hygiene materials is presented in Figure 7. Sanitary pads were the most commonly used menstrual product among participants, whereas cloth and menstrual cups were used by smaller proportions of respondents. The predominance of sanitary pads may reflect their accessibility, familiarity, perceived convenience, and availability in the local setting. The choice of menstrual product is influenced by multiple factors, including affordability, cultural acceptability, comfort, availability of water and sanitation facilities, and personal preference [4], [6]. The relatively limited use of menstrual cups also indicates an opportunity for evidence-based education concerning the available menstrual hygiene options, including reusable products.

The frequency of sanitary pad replacement is presented in Figure 8. Most participants reported changing sanitary pads every 2–4 hours, indicating generally appropriate hygiene management practices. A smaller proportion reported retaining pads for more than six hours. Prolonged use of menstrual products may be associated with discomfort and hygiene concerns, particularly when combined with inadequate washing facilities or improper disposal practices. Menstrual hygiene education should therefore continue to emphasize regular product replacement according to menstrual flow, personal comfort, product instructions, and access to appropriate sanitation facilities [6], [13], [14].

Figure 7. Menstrual hygiene products used by the participants

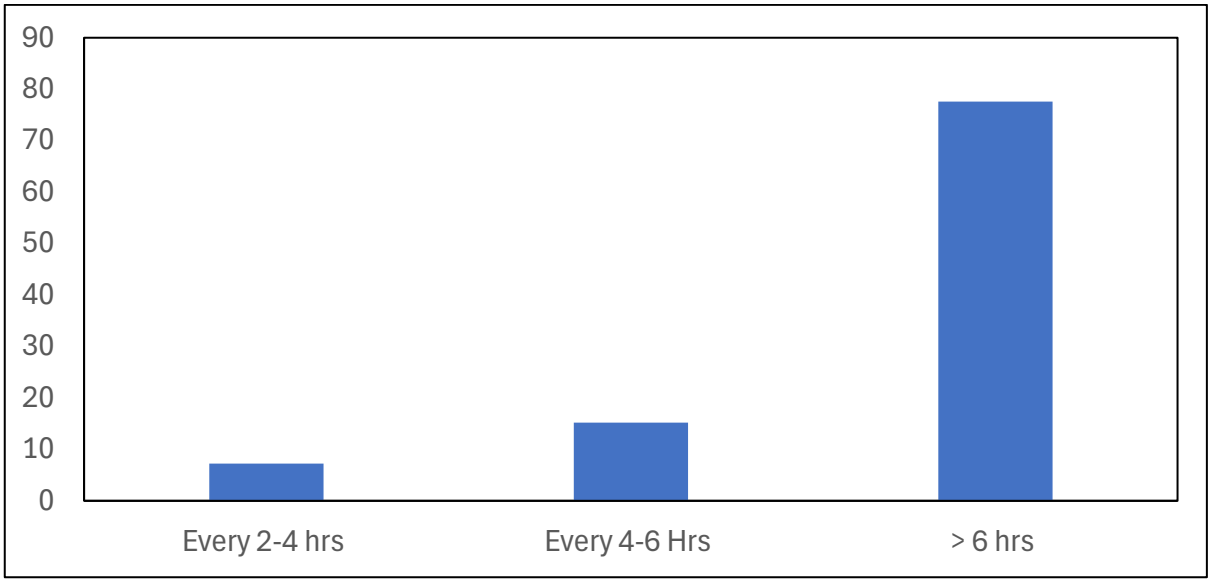

Figure 8. Frequency of sanitary pad replacement among the participants

The overall findings demonstrate that the participants generally reported satisfactory menstrual hygiene management, but important areas for improvement remain. The relatively high proportion of participants with regular cycles and cycle intervals of 21–35 days suggests that most respondents experienced broadly typical menstrual patterns. Nevertheless, approximately one-quarter reported irregular menstruation, while a smaller proportion reported cycle intervals outside the 21–35-day range or prolonged bleeding. Such findings support the importance of menstrual health education that goes beyond basic hygiene and includes recognition of potentially abnormal menstrual patterns and appropriate healthcare-seeking behavior.

The findings concerning menstrual hygiene practices are consistent with the broader literature emphasizing the importance of knowledge, access to menstrual products, sanitation facilities, and supportive social environments in promoting safe menstrual hygiene management [4], [5]. Previous research has shown that inadequate menstrual hygiene management can have physical and social consequences, while access to appropriate facilities and menstrual products can support participation in education and daily activities [9], [10]. The present findings similarly indicate that most participants have adopted commercially available menstrual products and generally practice regular sanitary pad replacement.

Academic stress emerged as the most frequently reported stress-related factor affecting menstruation. This finding is particularly relevant in the college environment, where academic workload, examinations, competition, and performance expectations may contribute to psychological stress. Menstrual health programs in educational institutions should therefore consider psychosocial well-being alongside physical hygiene. Counseling, stress-management education, adequate sleep, healthy nutrition, and appropriate referral mechanisms may provide supportive measures for students reporting persistent menstrual disturbances.

The findings also have implications for reproductive health education. Menstrual education should not be restricted to explaining menstruation and sanitary product use but should include information about normal menstrual patterns, warning signs, menstrual disorders, pain management, reproductive health, and when professional medical assessment is appropriate. Such comprehensive education can help reduce stigma and misconceptions while encouraging informed healthcare-seeking behavior [7], [8], [16]. Educational institutions can play an important role by integrating menstrual health information into student wellness programs and ensuring access to adequate sanitation and affordable menstrual products.

The use of sanitary pads as the predominant menstrual product may also indicate the importance of product availability and familiarity in determining menstrual management choices. Although menstrual cups and other reusable products may offer potential economic and environmental benefits, their acceptance depends on adequate information, comfort, cultural context, sanitation access, and individual preference [15]. Promotion of alternative menstrual products should therefore be evidence-based and should not replace the availability of conventional products for students who prefer or require them.

This study has several limitations. First, its cross-sectional design prevents determination of causal relationships between stress, lifestyle factors, and menstrual irregularities. Second, the study relied on self-reported questionnaire data, which may be affected by recall bias or social desirability bias. Third, the study was conducted in a single educational setting, limiting the generalizability of the findings to other populations and institutions. Future studies involving multiple institutions, larger samples, longitudinal follow-up, and validated menstrual health assessment instruments may provide stronger evidence regarding factors associated with menstrual irregularities and hygiene practices.

4. Conclusion

The present study demonstrates that menstrual hygiene practices among the surveyed college-going girls were generally satisfactory, with most participants reporting regular menstrual cycles, cycle intervals of 21–35 days, bleeding durations of 4–6 days, and sanitary pad replacement every 2–4 hours. Sanitary pads were the predominant menstrual hygiene product used by the participants. These findings indicate relatively good adoption of basic menstrual hygiene practices within the study population.

Despite these favorable practices, menstrual irregularities remained present among a substantial proportion of participants, and academic stress was the most frequently reported stress-related factor affecting menstruation. These findings highlight that menstrual health should be addressed as a multidimensional reproductive health issue rather than solely as a matter of menstrual product use. College-based menstrual health programs should incorporate education regarding normal and abnormal menstrual patterns, hygiene management, stress reduction, nutrition, reproductive health, and appropriate healthcare-seeking behavior.

Improved access to affordable menstrual hygiene products, adequate sanitation facilities, evidence-based education, and supportive counseling may further strengthen menstrual health management among college students. Future research should use larger and more diverse populations and longitudinal approaches to clarify the relationships among psychosocial factors, menstrual characteristics, and hygiene practices.

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