

Original Research Article

Awareness and attitude towards menstruation and menstrual hygiene among college students in Ernakulam district, Kerala

Anakha Beena Aravind¹, Veena P. S.¹, S. Swetha Rajeswary¹, Meera M. R.¹,
Anna Maria Bastine¹, Gopika Santhosh¹, Mehana Ashraf¹, Chitra Tomy²,
Apama Ajay³, Navami Sasidharan^{3*}

¹Amrita Institute of Medical Sciences, Amrita Vishwa Vidyapeetham, Kochi, Kerala, India

²Department of Physiology, Amrita Institute of Medical Sciences, Amrita Vishwa Vidyapeeth, Kochi, Kerala, India

³Department of Community Medicine, Amrita Institute of Medical Sciences, Amrita Vishwa Vidyapeeth, Kochi, Kerala India

Received: 06 February 2026

Revised: 21 May 2026

Accepted: 26 May 2026

*Correspondence:

Dr. Navami Sasidharan,

E-mail: iamnavami@gmail.com

Copyright: © the author(s), publisher and licensee Medip Academy. This is an open-access article distributed under the terms of the Creative Commons Attribution Non-Commercial License, which permits unrestricted non-commercial use, distribution, and reproduction in any medium, provided the original work is properly cited.

ABSTRACT

Background: Menstruation is a normal physiological process essential for women's physical, mental, and social well-being. However, social norms, cultural beliefs, and misconceptions continue to influence perceptions regarding menstruation, particularly among young adults.

Methods: A cross-sectional study was conducted among college students aged 18-25 years using a pre-validated semi-structured questionnaire. Convenience sampling and online data collection were employed. A total of 315 responses were analyzed using SPSS version 21. Knowledge and attitude scores were assessed, and associations with sociodemographic variables were analyzed using the Chi-square test, with $p < 0.05$ considered statistically significant.

Results: Among participants, 47.9% were females and 52.1% were males, with a mean age of 20.7 years. Overall, 54.3% demonstrated adequate knowledge regarding menstruation and menstrual hygiene. Adequate knowledge was significantly higher among females, urban residents, and participants whose mothers had high school education or above. Positive attitudes towards menstruation were observed in 59% of participants and were significantly associated with nuclear family structure ($p = 0.021$). Participants with adequate knowledge were more likely to exhibit positive attitudes ($p = 0.011$). Misconceptions regarding menstruation were relatively less prevalent.

Conclusions: College students demonstrated moderate to adequate knowledge and generally positive attitudes towards menstruation and menstrual hygiene. Improved awareness was associated with favourable attitudes, emphasizing the role of education and family environment in promoting healthy menstrual perceptions and practices.

Keywords: Menstruation, Menstrual hygiene, Awareness, Attitude, College students

INTRODUCTION

Menstruation is a normal physiological process occurring during the reproductive years of a woman's life. It represents a cyclical event in which the endometrium prepares for potential implantation of a fertilized ovum and is subsequently shed in the absence of fertilization.¹

The menstrual cycle has a mean duration of 28 days, with normal variation between 25 and 30 days.² This process is regulated by the coordinated action of hormones secreted by the hypothalamus, pituitary gland, and ovaries. During menstruation, not only the endometrial lining but also blood is expelled from the body, with an average blood loss of approximately 30 ml per cycle. Menstrual

bleeding gradually diminishes and eventually ceases with the onset of menopause, which typically occurs between 45 and 55 years of age.³ Even after being scientifically proven to be a completely normal and vital cycle, menstruation and menstrual hygiene are topics that are still bound by social and cultural norms. The persistence of myths and taboos surrounding menstruation contributes to widespread ignorance and misconceptions.⁴ In India, millions of women encounter substantial barriers to menstruation and menstrual hygiene management due to culturally varying myths and misconceptions. In certain communities, menstruating women are perceived as impure and are expected to maintain physical and social distance during this period. Over time, such restrictive norms have curtailed women's autonomy and contributed to adverse mental, physical, and emotional health outcomes.

Promoting good menstrual hygiene practices among young women can empower them to effectively manage the physical and emotional challenges associated with menstruation. Furthermore, it can facilitate the transmission of accurate, science-based knowledge about menstruation to future generations, including both men and women.⁵ Menstruation and menstrual hygiene play a significant role in the health of young women. Menstruation may also influence routine cognitive functioning and emotional well-being.⁶ Therefore, it is important that young individuals are educated about scientific methods to manage menstruation. There is also a need to enhance awareness, particularly among the younger population.⁷ Therefore, this study was undertaken to assess the awareness and attitudes toward menstruation and menstrual hygiene among both men and women. An educated woman serves as a valuable asset to society, as she facilitates the transmission of accurate knowledge to her children. This, in turn, contributes to the economic empowerment of women and promotes the overall development of the family, community, and the nation.

METHODS

This cross-sectional study was conducted among college students in Ernakulam district, Kerala, over a period of two months from September to October 2022. Students aged 18 to 25 years, corresponding to the typical age range of college-going students, enrolled in various non-medical colleges in Ernakulam district were included in the study. This age group was selected as it represents students currently pursuing undergraduate and postgraduate education and are readily accessible within the college setting. Students who did not provide informed consent and those studying in medical colleges were excluded from the study. Institutional Ethical Committee approval was obtained prior to the commencement of the study. The sample size was calculated based on a cross-sectional study conducted by Srinivasan et al among college students in Bengaluru Urban district, South India, in which 51.3% of

respondents had adequate knowledge regarding menstruation.⁸ Using the formula $n = Z^2 pq/d^2$, with a 95% confidence interval and 20% relative precision, the minimum required sample size was calculated to be 95. After accounting for a non-response rate of 10%, the final minimum sample size was estimated to be 105 participants. Convenience sampling was adopted to recruit students from colleges in Ernakulam district. Data were collected using a semi-structured questionnaire that included sections on sociodemographic characteristics, knowledge regarding menstruation, attitudes towards menstruation, and restrictions practiced during menstruation. The questionnaire was adapted from a previously published and validated tool used by Srinivasan et al, with suitable modifications made to align with the objectives and context of the present study. Following the acquisition of informed consent, sociodemographic details were obtained from all participants. Certain questions were directed exclusively to female participants and pertained to menstrual health, including age at menarche, availability and use of sanitary pads and other menstrual products, methods of disposal, knowledge regarding menstruation and menstrual products, sources of information, feelings and experiences during menstruation, and menstrual hygiene practices.

Male participants were asked questions assessing their basic knowledge of menstruation and sources of information, their opinions regarding discussions on menstrual health and hygiene in public, their comfort level in purchasing menstrual products for female family members or relatives, whether they had assisted anyone during menstruation, and their views on the necessity of men being informed about menstruation. The final section comprised common questions for both male and female participants, focusing on restrictions, misconceptions, and prevailing beliefs related to menstruation. The questionnaire was disseminated to participants through various social media platforms using Google Forms, and responses were collected electronically. The data were entered into Microsoft Excel and analysed using the Statistical Package for the Social Sciences (SPSS) software version 21. Categorical variables were expressed as frequencies and percentages, while continuous variables were summarized using mean and standard deviation. The Chi-square test was applied to determine the association between knowledge and attitude towards menstruation and selected sociodemographic variables. A p value of less than 0.05 was considered statistically significant.

RESULTS

The study was conducted among college students from various institutions in Ernakulam district. The participants were aged between 18 and 25 years, with a mean age of 20.7 years. Of the 315 study participants, 47.9% were females and 52.1% were males.

Table 1: Socio demographic details of the study participants (n=315).

Socio demographic characteristics	Frequency (N)	Percentage (%)	
Age (years)	18-20	143	45.4
	21-25	172	54.6
Gender	Male	161	51.1
	Female	154	48.9
Religion	Hindu	173	54.9
	Christian	97	30.8
	Muslim	40	12.7
	Others	5	1.6
Place of residence	Urban	171	54.3
	Rural	144	45.7
Type of college	Arts	122	38.7
	Science	69	21.9
	Engineering	106	33.7
	Others	18	5.7
Current stay	Day scholar	180	57.1
	Hostel	111	35.2
	Others	20	6.3
Educational status of mother	Professional	110	34.9
	Graduate	114	34.2
	Intermediate	29	9.2
	High school	54	17.1
	Middle school	6	1.9
	Primary school	0	0
Occupation of mother	Illiterate	2	0.6
	Professional	6	1.9
	Homemaker	3	1
	Unskilled	20	6.3
	Skilled	130	41.3
Educational status of father	Retired	156	49.5
	Professional	119	37.8
	Graduate	104	33
	Intermediate	35	11.1
	High school	48	15.2
	Middle school	7	2.2
Occupation of father	Primary school	1	0.3
	Illiterate	1	0.3
	Professional	60	19
	Homemaker	5	1.6
	Unskilled	27	8.6
Socio economic status	Skilled	195	61.9
	Retired	28	8.9
	APL	288	91.4
	BPL	27	8.6
Type of family	Nuclear	205	65.0
	Joint family	40	12.7
	3 generation	70	22.2

Students belonged to Arts (38.7%), Science (21.9%), Engineering (33.7%), and other courses (5.7%). The majority were day scholars (57.1%) and reported residing in urban areas (54.3%). Most participants belonged to the

APL category (91.4%). With regard to family structure, 65% of the participants belonged to nuclear families (Table 1). Family members were the most common source of knowledge about menstruation among female participants (69.6%), while males more frequently reported magazines/books (59.6%) and other sources (71.7%).

School-based education contributed more to knowledge among females (65.4%) than males (34.6%). The internet served as an important source of information for both genders, with comparable proportions among females (52.1%) and males (47.9%). Television was reported equally by both groups (Table 2).

Table 2: Source of knowledge about menstruation among study participants.

Source of knowledge	Females N (%)	Males N (%)
TV	27 (50)	27 (50)
Internet	100 (52.1)	92 (47.9)
Family	112 (69.6)	49 (30.4)
School	68 (65.4)	36 (34.6)
Magazines and books	23 (40.4)	34 (59.6)
Others	15 (28.3)	38 (71.7)

All were aware of menstrual products such as tampons, cloths, and reusable cloth pads. A majority affirmed the availability of sanitary pads in their colleges (72.1%). Most participants reported bathing daily during menstruation (93.5%). Sanitary waste was commonly wrapped and disposed of separately (37%) or burnt (39%). Most participants washed their private parts with water every time they changed their sanitary pads (70.8%), and 92.9% did not apply any substances to their private parts during menstruation.

While 66.2% experienced pain during or after menstruation, only 5.8% had been treated for at least one episode of urinary tract infection (UTI) in the past six months. Among female participants, 84.4% had prior information regarding menstruation, and 64.9% did not observe any rituals following their first menstrual cycle. Following the onset of menstruation, 50.6% reported feeling anxious and 42.2% reported irritability.

The menstrual cycle was regular for most participants (79.9%), and a majority reported experiencing pain during menstruation (96.1%). Only 52 participants (33.7%) missed a day of work or college during menstruation.

Premenstrual symptoms were reported by 81.2% of participants, with 55.2% feeling low during that period. About 84.4% were comfortable discussing menstruation, while only 15.5% reported a history of taking medication to postpone menstruation.

Table 3: Knowledge of study participants regarding menstruation and its associated factors (n=315).

		Knowledge		P value
		Adequate N (%)	Inadequate N (%)	
Gender	Female	116 (75.3)	38 (24.7)	<0.001
	Male	55 (34.2)	106 (65.8)	
Place of residence	Rural	64 (44.4)	80 (55.6)	0.001
	Urban	107 (62.6)	64 (37.4)	
Educational status of mother	High school and above	170 (55.4)	137 (44.6)	0.026
	Below high school	1 (12.5)	7 (87.5)	

Table 4: Distribution of study participants based on their opinion about restrictions that should be followed during menstruation (n=315).

Restrictions	Yes (%)	No (%)
Not allowed to enter the common areas of house	310 (99.6)	5 (0.4)
Not allowed to go to college and forced to stay at home	304 (99.2)	11 (0.8)
Not allowed to go to temples	239 (75.9)	76 (24.1)
Not allowed to go out of the house	302 (95.9)	13 (4.1)
Cannot attend functions	300 (95.2)	15 (4.8)
Cannot eat with others	304 (96.5)	11 (3.5)
Cannot eat certain food items	289 (91.7)	26 (8.3)
Cannot touch regular items	292 (92.7)	23 (7.3)
Separated from rest of the family	302 (95.9)	13 (4.1)
Cannot play sports or do exercise	283 (89.8)	32 (10.2)
Not allowed to enter the kitchen	310 (98.4)	5 (1.6)
Not allowed to touch others	306 (97.1)	9 (2.9)

Table 5: Association of knowledge of participants regarding menstruation with their attitude towards it.

		Attitude		P value
		Positive (%)	Negative (%)	
Knowledge	Adequate	112 (65.5)	59 (34.5)	0.011
	Inadequate	74 (51.4)	70 (48.6)	

To assess male participants' perspectives, questions were asked regarding the importance of men knowing about menstruation and the appropriateness of discussing menstrual health in public. The majority (94.4%) felt it was important for men to know about menstruation, while 3.7% were unsure. Most participants (82.6%) felt it was appropriate for women to discuss menstrual health in public. More than half of the male participants (55.9%) reported having helped a female friend or the relative during menstruation, and the 70.1% were not embarrassed to purchase menstrual products. Regarding sources of information, most female participants reported family as their primary source, followed by the internet and school. Knowledge regarding menstruation was assessed using a 14-item questionnaire, with one mark awarded for each correct response.

Overall, 54.3% of participants demonstrated adequate knowledge, with a mean score of 10.34. A significant association was observed between knowledge and place of residence, with participants from urban areas showing higher levels of adequate knowledge (62.6%). Maternal education also played a significant role, as the

participants whose mothers had high school education or above demonstrated better knowledge (55.4%). Female participants (75.3%) had significantly higher knowledge levels compared to male participants (34.2%). No significant association was observed between knowledge and course of study, family type, religion, socioeconomic status, mother's occupation, or father's occupation and education (Table 3). Attitude towards menstruation was assessed by evaluating participants' views on restrictions commonly imposed during menstruation.

Overall, 59% of participants exhibited a positive attitude, with 54.5% of females and 63.4% of males demonstrating positive attitudes. Univariate analysis revealed a statistically significant association between attitude and family type. Participants from nuclear families showed a more positive attitude (63.4%) compared to those from joint or three-generation families ($p=0.021$) (Table 4). A statistically significant association was also observed between knowledge and attitude. Participants with higher levels of knowledge regarding menstruation demonstrated a more positive attitude (68.5%) compared to those with lower knowledge levels ($p=0.011$) (Table 5).

Overall, the findings of the present study indicate that more than half of the study participants possessed adequate knowledge regarding menstruation and menstrual hygiene, and a majority demonstrated a positive attitude towards menstruation-related issues. Knowledge levels were significantly higher among participants residing in urban areas, those whose mothers had attained a high school level of education or above, and among female participants. Attitude towards menstruation was found to be significantly associated with the type of family, with participants from nuclear families exhibiting a more positive attitude. Furthermore, a statistically significant association was observed between knowledge and attitude, wherein participants with higher knowledge scores were more likely to have a positive attitude towards menstruation and menstrual hygiene practices.

DISCUSSION

In the present study, 54.3% of participants demonstrated adequate knowledge regarding menstruation, which is marginally higher than the findings of a similar study conducted by Srinivasan et al, where 51.3% of students were found to have adequate knowledge.⁸ This indicates a modest improvement in awareness levels, possibly reflecting better access to information and increasing public discourse on menstrual health among young adults.

The study further revealed that 94.2% of female participants correctly identified the uterus as the source of menstrual bleeding. This finding contrasts sharply with the study conducted by Prajapati et al in Gandhinagar, where 51.1% of participants lacked knowledge regarding the source of menstrual bleeding.⁹ The higher level of awareness observed in the present study may be attributed to improved educational exposure and increased emphasis on reproductive health education in recent years.

In the present study, 5.8% of female participants reported experiencing at least one episode of urinary tract infection in the past six months. Evidence from previous studies suggests that poor menstrual hygiene practices are associated with a higher prevalence of urinary and reproductive tract infection symptoms, underscoring the link between menstrual hygiene and urogenital health outcomes.¹⁰ Similarly, a study conducted by Anand et al reported that unhygienic menstrual practices could be one of the contributing factors for reproductive morbidity.¹¹

Another study by Balamurugan et al reported a considerably higher prevalence of reproductive tract infections (40.4%) among women of reproductive age.¹² Socio-demographic factors such as poor socioeconomic status, inadequate menstrual hygiene practices, and illiteracy have been shown to directly influence the occurrence of reproductive tract infections. These conditions can be effectively mitigated through increased awareness, behaviour change communication, and

structured educational interventions promoting safe menstrual hygiene practices.

The mean age of menarche among female participants in the present study was 12.79 years, suggesting a declining trend in the age of onset of menstruation. An even higher mean age of menarche (14.7 years) was reported in a study conducted by Dahiya et al among schoolgirls in Delhi between 2006 and 2009. The observed decline in age at menarche may reflect changing nutritional status, lifestyle factors, and socioeconomic conditions.¹³

With respect to sources of information, a study conducted among schoolgirls in Egypt by El-Gilany et al identified mass media as the primary source of information on menstrual hygiene, followed by mothers.¹⁴ In contrast, the present study found that family members constituted the major source of information, followed by the internet and schools. This highlights the important role of family-based communication in shaping menstrual knowledge and attitudes within the local sociocultural context.

Menstrual hygiene practices in the present study were assessed based on the type of menstrual absorbent used, frequency of changing menstrual products, and disposal methods. Overall, the majority of female participants demonstrated good menstrual hygiene practices. Notably, 97.4% reported cleaning their genital area after changing menstrual products using water, soap, antiseptics, or other cleansing agents. This finding is substantially higher than that reported by Pokhrel et al, where only 24.8% of participants practiced regular genital cleaning following menstrual product use.¹⁵ Only 19.4% of female participants in the present study reported using cloth as a menstrual absorbent. In urban settings, the involvement of school teachers in menstrual health education may have contributed to improved hygiene practices. This observation likely reflects the impact of higher female literacy rates in Kerala. Supporting this finding, a study conducted in Thiruvananthapuram reported adequate menstrual hygiene practices among the majority of participants.¹⁶ In contrast, a study from Bangladesh by Haque et al reported that only 22.4% of adolescents used clean sanitary napkins as menstrual absorbents, indicating significant regional disparities in menstrual hygiene practices.¹⁷

The present study was conducted among college students without a medical background; therefore, their responses may reasonably represent the general perspectives of the young adult population. The inclusion of nearly equal proportions of male and female participants enabled a comprehensive assessment of attitudes and perceptions related to menstruation across genders. Since earlier studies predominantly focused on high school students, the present study provides valuable insight into menstrual awareness and attitudes during late adolescence and early adulthood. The primary limitation of the study was its short duration, as data collection was completed within a limited time frame. Additionally, since the questionnaire was administered through online platforms, individuals

without access to electronic devices or internet facilities may have been underrepresented.

CONCLUSION

The present study found that the majority of participants had adequate knowledge regarding menstruation and menstrual hygiene; however, male participants demonstrated comparatively lower levels of knowledge than females. Participants residing in urban areas and those whose mothers had attained a high school level of education or higher showed better awareness of menstruation and menstrual hygiene. Misconceptions related to menstruation were less prevalent among both genders. A more positive attitude toward menstruation was observed among participants from nuclear families, and those with adequate knowledge were more likely to exhibit positive attitudes toward the subject.

Overall, this study on awareness and attitudes toward menstruation and menstrual hygiene among college students in Ernakulam district, Kerala, indicates an encouraging trend of increasing awareness and progressive perceptions among the younger population. The findings suggest that educational and awareness initiatives have contributed to dispelling myths, reducing stigma, and promoting open discussions about menstruation. This shift toward a more inclusive and scientific understanding underscores the need for continued educational interventions, particularly targeting male students and individuals from rural backgrounds, to further normalize menstruation as a natural and essential biological process rather than a taboo.

Funding: No funding sources

Conflict of interest: None declared

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

REFERENCES

- Mihm M, Gangooly S, Muttukrishna S. The normal menstrual cycle in women. *Anim Reprod Sci*. 2011;124(4):229-36.
- Reed BG, Carr BR. The normal menstrual cycle and the control of ovulation. Endotext. South Dartmouth (MA): MDText.com, Inc. 2000.
- WHO. Menopause. Geneva: World Health Organization. 2024. Available at: <https://www.who.int/news-room/fact-sheets/detail/menopause?>. Accessed on 06 January 2026.
- Garg S, Anand T. Menstruation related myths in India: strategies for combating it. *J Fam Med Prim Care*. 2015;4(2):184-6.
- Jadwat A, Bassa UB, Rungusumy A, Rughooputh MS. Level of awareness on menstrual health among university students in Mauritius. *Int J Womens Health Wellness*. 2021;7:122.
- Sundström Poromaa I, Gingnell M. Menstrual cycle influence on cognitive function and emotion processing—from a reproductive perspective. *Front Neurosci*. 2014;8:380.
- Coast E, Lattof SR, Strong J. Puberty and menstruation knowledge among young adolescents in low- and middle-income countries: a scoping review. *Int J Public Health*. 2019;64(2):293-304.
- Srinivasan D, Agrawal T, Attokaran T, Fathima FN, Johnson AR. Awareness, perceptions and practices regarding menstruation and menstrual hygiene among students of a college in Bengaluru Urban district, South India: a cross-sectional study. *Int J Community Med Public Health*. 2019;6(3):1126-32.
- Prajapati J, Patel R. Menstrual hygiene among adolescent girls: a cross-sectional study in urban community of Gandhinagar. *J Med Res*. 2015;1(4):122-5.
- Karmi JA, Alshrouf MA, Haddad TA, Alhanbali AE, Raiq NA, Ghanem H, et al. Urinary and reproductive tract infection symptoms and menstrual hygiene practices in refugee camps in Jordan: a cross-sectional study. *Womens Health (Lond)*. 2024;20:17455057241240920.
- Anand E, Singh J, Unisa S. Menstrual hygiene practices and its association with reproductive tract infections and abnormal vaginal discharge among women in India. *Sex Reprod Healthc*. 2015;6(4):249-54.
- Balamurugan SS, Bendigeri N. Community-based study of reproductive tract infections among women of the reproductive age group in the urban health training centre area in Hubli, Karnataka. *Indian J Community Med*. 2012;37(1):34-8.
- Dahiya M, Rathi V. Relationship between age at menarche and early-life nutritional status in India. *Br J Sports Med*. 2010;44(1):i42-6.
- El-Gilany AH, Badawi K, El-Fedawy S. Menstrual hygiene among adolescent schoolgirls in Mansoura, Egypt. *Reprod Health Matters*. 2005;13(26):147-52.
- Pokhrel S. Impact of health education on knowledge, attitude and practice regarding menstrual hygiene among pre-university female students of a college located in urban area of Belgaum. *IOSR J Nurs Health Sci*. 2014;3(1):38-44.
- Nair MKC, Chacko DS, Darwin MR, Padma K, George B, Soman S. Menstrual disorders and menstrual hygiene practices in higher secondary school girls. *Indian J Pediatr*. 2012;79(1):S74-8.
- Haque SE, Rahman M, Itsuko K, Mutahara M, Sakisaka K. The effect of a school-based educational intervention on menstrual health: an intervention study among adolescent girls in Bangladesh. *BMJ Open*. 2014;4(7):e004607.

Cite this article as: Aravind AB, Veena PS, Rajeswary SS, Meera MR, Bastine AM, Santhosh G, et al. Awareness and attitude towards menstruation and menstrual hygiene among college students in Ernakulam district, Kerala. *Int J Community Med Public Health* 2026;13:2894-9.