

# Menstrual knowledge and association with menstrual hygiene practices among school going adolescents of Tokha Municipality, Nepal

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## ABSTRACT

Menstrual hygiene is crucial for women's health and well-being, but societal acceptance of menstruation remains a significant issue in Nepal. Despite government efforts to reduce stigma, the health of women, children, and adolescents is still affected by its widespread superstitions. As a result, studies on menstrual knowledge and hygiene practices among adolescents in Nepal are scarce. The primary goal of this study is to further understand the depth of adolescent girls' knowledge about menstruation and its association with menstrual hygiene practices. In order to address this, we performed a descriptive cross-sectional study in Tokha municipality of Kathmandu as the study area. The study population consisted of female teenagers studying in randomly selected schools. A total of 404 samples were collected. Statistical significance of the association between the independent and dependent study variables were assessed using the chi-square test and logistic regression. We found that about 78.5% of the total of respondent had knowledge about menstruation, and mothers were main source of information. Menstrual practices, such as type of material used (AOR=2.549 95%CI= 1.078-6.710), frequency of cleaning genitalia at least two times (AOR=1.639; 95% CI=1.214-6.328), at least 3 times (AOR= 3.119; 95% CI=1.429-9.328) and product used to clean genitalia (AOR= 0.623 95%CI= 1.429-9.328) were associated with knowledge of respondents. It can be stated that teenage schoolgirls generally have decent knowledge about menstruation. Menstrual health issues are a concern that has to be addressed. Our study implicates that adolescent menstrual hygiene practices are associated with menstrual knowledge.

## Key words:

adolescent students; knowledge; menstruation; menstrual hygiene; menstrual practices

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## INTRODUCTION

Menarche marks the transition from girlhood to womanhood, which often requires psychological and social adjustments<sup>1</sup>. It is a well-known fact that menstruation is often considered unsanitary in Nepo-indian culture. Girls are often excluded from celebrating this occasion due to imposed restrictions by their families, and the lack of awareness of the occasion has had a negative impact, particularly on women and girls<sup>2</sup>. As a result, studies have shown that many adolescent girls lack knowledge on this developmental milestone<sup>2-4</sup>. In religious communities like Nepal and India, menstruation had previously been considered unsanitary and women in menstruation were often excluded from celebrating the religious occasions<sup>2</sup>. Although societal advancements have resulted in such practices no longer being widespread, remnants of past practices still exist, especially in rural and indigenous regions<sup>5</sup>.

Furthermore, due to social constraints and parental views, some adolescent girls still lack awareness of menstruation. Lack of menstrual knowledge and poor hygiene management can lead to a wide range of problems, including psychological stress, pain, discomfort, and reproductive tract infections to venereal diseases<sup>5-8</sup>. Studies have revealed that the majority of adolescent girls are unaware of the relationship between physiology and proper menstrual hygiene. Additionally, the leading sources of information on menstruation are their mothers, television, friends, teachers, and relatives<sup>7,9</sup>.

Using sanitary pads and washing the vaginal area properly are two important parts of excellent hygiene during menstruation. Because of this, access to sanitary products that are hygienic, gentle,

permeable, and cost-effective is essential in ensuring physical well-being among women<sup>10</sup>. Moreover, proper menstrual hygiene management and practices would also immediately contribute to accomplishing various targets and indicators set by sustainable development goals (SDGs) on universal education, promoting gender equality to the highest level, and empowering women<sup>11</sup>.

Women with menstruation knowledge are more inclined towards good menstrual hygiene practice, ultimately reducing the odds of infections and other health-related problems that may occur during menstruation<sup>9,10</sup>. However, awareness on this topic seems to be inadequate, and literature on educating women on sanitary practices is deafeningly silent on the issue of menstruation management<sup>11</sup>.

Social perception coupled by taboos and misconception has further influenced gender discrimination and deteriorated women empowerment, slowing the progress of sustainable development goals<sup>12</sup>. According to a combined report of UNICEF and Water Aid, more than a third of girls in South Asian region leave school during their periods as there aren't restrooms or pads available at school, failing to meet the WHO criteria of one toilet for every 25 girls resulting in health consequences and poor academic performance<sup>11,13</sup>.

Around three hundred thousand women and adolescent girls in Nepal experience menstruation and many struggle to follow recommended menstrual hygiene practices for maintaining proper sexual, reproductive, menstrual health and their ability to effectively manage monthly hygiene<sup>14</sup>. One study conducted in rural parts of Nepal found that around three out of four adolescents had perception of leaving school during their period<sup>15</sup>. Moreover, the lack of privacy and

menstrual logistics in schools is a problem that makes students vulnerable to mental stress and discomfort<sup>16</sup>.

Menstruation is often viewed as unclean, impure, and shameful and majority of women experience some form of restriction during this time. Adolescent girls face challenges and barriers pertaining to their sexual and reproductive health as a result of gender inequality and discriminatory social norms<sup>12-16</sup>. Adolescent is one of the priority programs of Nepal and it is essential for women and girls to have the required information, facilities, practices and cultural context to manage menstrual hygiene<sup>14,15</sup>.

Various researchers have conducted studies in rural parts exploring various aspects of menstrual knowledge and hygiene in rural areas, but few studies has examined the specifics of adolescent females' health problems, menstrual knowledge and menstrual practices and its relationship with knowledge level in poverty affected urban areas. Therefore, it was deemed appropriate to investigate menstruation-related knowledge and habits among school-aged teenagers. Thus, this study was conducted to determine the prevalence of knowledge about menstruation and its association with menstrual hygiene practices. Additionally, the research aimed to identify common health problems faced by adolescent females during their menstrual periods. The findings from the study can be useful for creating a program aimed at increasing awareness regarding menstruation.

## METHODOLOGY

This study was descriptive cross-sectional in design and was conducted in Tokha municipality of Kathmandu district. Data were collected from seven randomly selected schools between July-September of 2022.

The study population consisted of teenage female students. The sample size

was calculated by using the formula for descriptive studies<sup>17</sup> (i.e.,  $n = Z^2pq/e^2$ ) with allowable error at 5%, the non-response rate at 10%, and the p-value taken as 0.4 from a previous study<sup>2</sup>. Using the formula and after adjusting for the non-response rate, the total sample size was 404. To avoid any potential missing data, and increase both the sample size and credibility of the study, we estimated sample size using the formula for infinite population.

This is a descriptive cross-sectional study that used a multistage sampling method. Simple random sampling method (lottery method) was used to select seven schools randomly. Then, the number of samples to be extracted from each selected school was estimated using probability proportionate to size (PPS) sampling technique. Finally, students were assigned a random number from the attendance register and randomly picked. In case of student being absent, next adjacent number was picked for the survey.

Permission to conduct data collection was asked before the data collection process in selected schools by talking to the administration. Schools that did not grant permission were excluded and another school was included as a replacement using the same lottery method. Upon fulfillment of the sample size, samples were collected from those selected seven schools. Health science undergraduate students collected the data. Guardian assent forms were provided for students under 18 to participate in the study. Those who were 18 years and above were given a consent form.

In order to gather data, a semi-structured questionnaire was created in both English and Nepali, however, the English version was used for data collection. The questionnaires consisted of questions about socio-demographic information, knowledge and information about menstruation, health issues associated with menstruation, and menstrual hygiene practices. Since our

questionnaire was not standard, a literature review served as a guide for constructing the questionnaire and establishing its validity.

To ensure reliability, the questionnaire was pretested among 10% of the total sample size in similar target populations in different schools. Based upon the feedback from the pretesting, questionnaires were adjusted. Data from the pretesting was not included in the result sections below and the respondents involved in pretesting were not included in the final research.

EPI data 3.1 software was used for data entry, while SPSS version 23 was used for analysis. Before data entry, all acquired data was coded and validated multiple times for accuracy and completeness. For categorical data, frequency and percentage were calculated using descriptive summary statistics. For numerical data, mean and standard deviation were calculated. The relationship between independent and dependent variables was evaluated using the chi-square test. Pearson's chi-square and logistic regressions were used to analyze the relationship between the independent and dependent variables. The confidence interval was set at 95% when applying multiple logistic regression models to variables with a p-value of less than 0.05 in the bivariate analysis.

Ethical approval from Nobel College's Institutional Review Committee was obtained, and a formal letter was sent to schools for conducting the study. Data were collected after clarifying the purpose and receiving verbal consent. School Principals provided informed consent and assent forms were filled out by parents. Confidentiality, anonymity, and privacy were maintained for all participants.

## RESULTS

### *Socio-demographic information of the respondents*

Table 1, displays the socio-demographic characteristics of respondents, with a mean age of  $13.88 \pm 1.22$ . Out of 404 respondents, 56 (13.86%) were aged 10-12, 312 (77.22%) were aged 13-15, and 36 (8.92%) were aged 16-18. Religions were categorized into Hindu, Buddhist, Christian, and Muslim, with percentages of 79%, 15.1%, 5.7%, and 0.2%, respectively. More than one third of respondents were Janajati 154 (38.1%). More than half of them were studying at secondary level 215 (53.2%) and almost half of the respondent's mothers were able to read and write properly 199 (49.3%).

**Table 1.** Socio-demographic information about female students

Variables	Frequency (n=404)	Percent (%)
<b>Age in years</b>		
10-12	56	13.86
13-15	312	77.22
16-18	36	8.92
Mean $\pm$ SD = $13.88 \pm 1.226$		
Mean age at menarche= $13.25 \pm 1.56$		
<b>Religion</b>		
Hindu	319	79
Buddhist	61	15.1
Christian	23	5.7

Variables	Frequency (n=404)	Percent (%)
Muslim	1	0.2
<b>Ethnicity</b>		
Brahmin	98	24.3
Chhetri	134	33.2
Janajati	154	38.1
Dalit	18	4.4
<b>Education level</b>		
Lower secondary	189	46.8
Secondary	215	53.2
<b>Mother's level of education</b>		
Cannot read and write	74	18.3
Can read and write	199	49.3
Up to 12	82	20.3
Bachelor's level	40	9.9
Master's level and above	9	2.2
Age at menarche		

### ***Knowledge and Information Regarding Menstruation***

More than three-fourth of the respondents had knowledge about menstruation 317 (78.5). Majority of respondents 267 (41%) received menstrual knowledge from mothers, followed by friends 62 (9.5%), and books 109 (16.7%).

Menstruation was perceived as a natural process by majority of students 390 (96.5%). Respondents mainly perceived using sanitary pads 66 (16.3%) as way of maintaining menstrual hygiene. A total of 329 (81.4%) respondents consulted their mothers first regarding menstrual health problems.

**Table 2.** Knowledge and information about menstruation (n=404)

Variables	Frequency	Percent (%)
Prior Knowledge about menstruation		
Yes	317	78.5
No	87	21.5
Source of information* (n= 317)		
Mother	267	41
Friend	62	9.5
Sister	54	8.3
Teacher	46	7.1
Media (TV/radio/newspaper)	31	4.8
Books	109	16.7
All of above	82	12.6
Understanding/perception about Menstruation*		
Natural/Physiological process	390	96.5
Curse from God	9	2.2
Disease	1	0.2
Don't know	4	1
Understanding regarding Menstrual Hygiene*		
Use of sanitary pads	66	16.3
Frequency of changing the sanitary protection	50	12.4

Variables	Frequency	Percent (%)
Bathing during menstruation	53	13.1
Proper disposal of material used	36	8.9
Use of toilet	29	7.2
Use of clean water and soap for hygiene	53	13.1
All of above	278	68.8
Don't know	14	3.5
First consultation during health issues related with menstruation*		
Mother	329	81.4
Friend	20	5
Sister	48	11.9
Relative	3	0.7
Other	4	1

\*Multiple choice questions

### ***School Absenteeism and Menstruation***

Among the total respondents 404, 229 (56.7%) missed at least one day of school owing to monthly health issues in past three months, while 175 (43.3%) did

not miss any school days due to menstrual health issues. Most of the absentee students faced pain and discomfort 163(71.3%) during their menses.

**Table 3.** School absenteeism among female students due to menstruation (n=404)

Variables	Frequency	Percent (%)
Missed at least one day of school (past three months)		
Yes	229	56.7
No	175	43.3
Reasons to miss the school*(n= 229)		
Pain/discomfort	163	71.3
Lack of school facilities	7	3.05
Fear and embarrassment	23	10.09
Lack of material or sanitary pads	3	1.2
Lack of separate toilet facility	9	3.93
Lack of continuous water supply	8	3.5
Others	16	6.93

\*multiple response

### ***Association between knowledge and menstrual practice***

The proper management of hygiene during menstruation is significantly influenced by the practices adopted at the time. The table below shows the relationship between knowledge among respondents and their menstruation practices. The majority of respondents used

sanitary pads, which is statistically associated with their knowledge level ( $p < 0.04$ ). They change the materials used for menstruation twice a day, with the most common interval being every 4-6 hours. However, neither variable had an association with knowledge among respondents. Most respondents dispose of their pads in a dustbin ( $p$ -value  $< 0.03$ ), and

water is commonly used for cleaning the genitalia (p-value <0.01). Also, the frequency of cleaning the genital area also had an association with knowledge

regarding menstruation. (p-value <0.02). Practice such as taking a bath during the period had no association with knowledge among respondents.

**Table 4.** Association between knowledge and menstrual practice

Menstrual Hygiene Practices	Knowledge about menstruation		$\chi^2$	p-value
	Yes n (%)	No n (%)		
Use of material during menstruation			3.601	0.04*
Sanitary pads	265(80.3)	65(19.7)		
Clothes	52(70.3)	22(29.7)		
Frequency of changing the material used			0.42	0.97
Once in a day	20(76.9)	06(23.1)		
Twice in a day	120(78.4)	33(21.6)		
3-4 times in a day	177(78.7)	48(21.3)		
Time duration of changing the material used			1.432	0.49
Every hour	38(76)	12(24)		
Every (4-6) hours	228(80)	57(20)		
More than 6 hours	51(73.9)	18(26.1)		
Method of Disposal			4.861	0.03*
Put it in the dustbin	290(78.4)	80(21.6)		
Reuse it	01(33.3)	02(66.7)		
Burn it	01(100)	-		
Bury in open field	03(100)	-		
Throw with other waste	22(81.5)	05(18.5)		
Take bath during menstruation				
Yes	307(78.5)	84(21.5)		
No	10(76.9)	02(23.1)		
Frequency of cleaning genitalia during menstruating days			8.547	0.02*
Once in a day	52(76.5)	16(23.5)		
At least Twice in a day	96(80.7)	23(19.3)		
At least 3-4 times in a day	169(77.9)	48(22.1)		
Material used for cleaning genitalia			20.229	<.001*
Only water	147(69.7)	64(30.3)		
Soap and water	170(88.1)	23(11.9)		
Access to private toilet during menses			0.0357	0.550
Yes	261(77.9)	74(22.1)		
No	56(81.2)	13(18.8)		

\*Indicates p value less than 0.05,  $\chi^2$  is chi-square value

#### ***Regression analysis of menstrual hygiene practices with knowledge regarding menstruation***

After adjusting all the menstrual practice variables that were found to have

statistical significance with knowledge in bivariate analysis, it was found that women using sanitary pads during their periods were 2.5 times more likely to have knowledge about menstruation than women

who used clothes (AOR= 2.549; 95%CI= 1.078,6.710). Similarly, finding also indicates higher odds of knowledge with frequency of cleaning the vaginal area. It was found that girls cleaning their vaginal area were 3 times more likely to have knowledge (AOR= 3.119 95%CI= 1.429,

9.328) than those cleaning just once a day. Contrarily, knowledge among females who clean their vaginal area with soap and water showed lower odds of knowledge as they were only 0.6 times (AOR= 0.623 95%CI= 0.234- 0.979) likely to be knowledgeable.

**Table 5.** Binary and multivariate logistic regression of menstrual practices with knowledge among female students

Menstrual practices	COR (95% CI)	p-value	AOR (95% CI)	p-value
Use of material during menstruation				
Sanitary pads	3.580(1.103-5.849)	0.03	2.549(1.078-6.710)	0.04
Clothes	Ref.		Ref.	
Method of Disposal				
Put it in the dustbin	1.214(0.446-3.306)	0.70	1.429(0.629-3.123)	0.75
Reuse it	6.800(0.661-18.398)	0.10	4.235(0.354-24.248)	0.17
Burn it	2.342(0.232-8.342)	1.00	3.456(0.546-7.234)	1.89
Bury in open field	1.345(0.457-11.984)	0.99	1.872(0.234-6.234)	1.45
Throw with other waste	Ref.		Ref.	
Frequency of cleaning genitalia during menstruating days				
Once in a day	Ref.		Ref.	
At least twice in a day	2.836(1.459-5.839)	0.02	1.639(1.214-6.328)	0.04
At least 3-4 times in a day	3.586(1.832-7.275)	0.01	3.119(1.429-9.328)	0.02
Product used for cleaning genitalia				
Only water	Ref.		Ref.	
Soap and water	0.295(0.1247-0.589)	0.04	0.623(0.234-0.979)	0.01

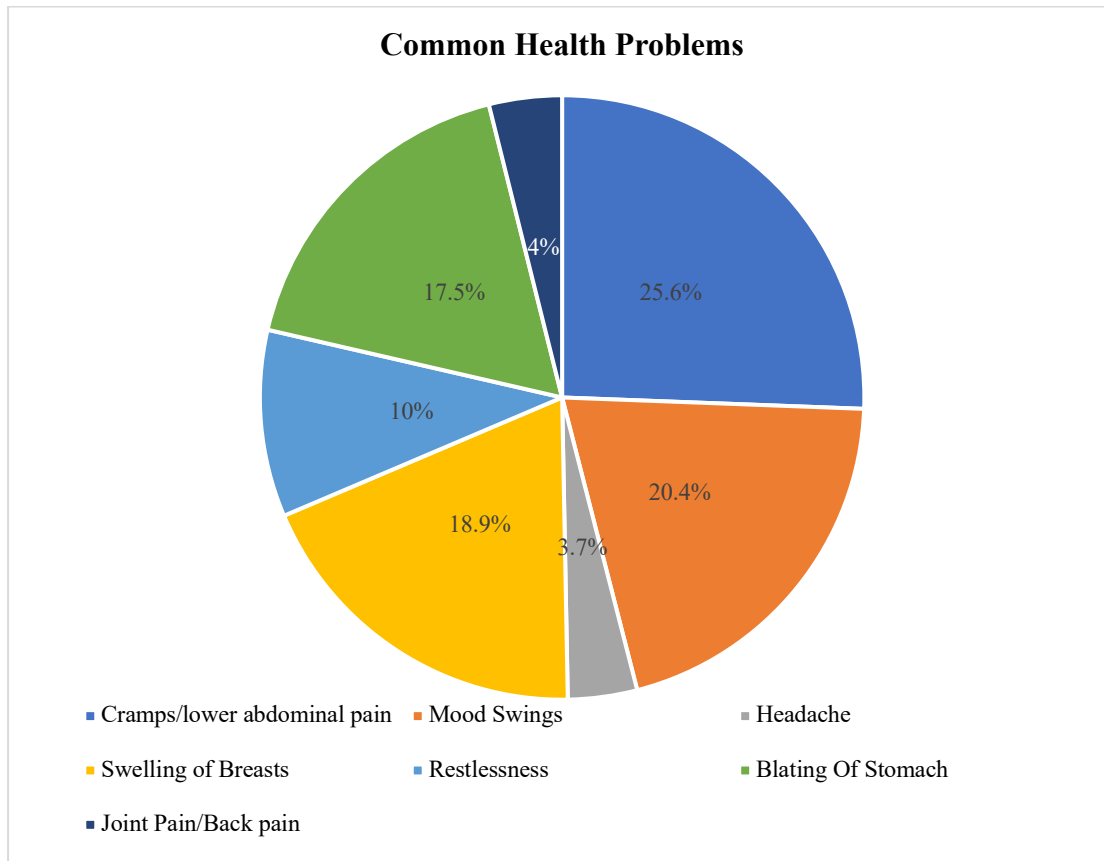
COR= crude odds ratio, AOR= adjusted odds ratio

### **Common Health Problems Experienced by the Females during Menstruation**

One-fourth of the respondents (25.6%) had cramps during their period, while one-fifth (20.4%) reported fast mood

variations. Breast swelling and discomfort were reported by 18.9% of responders. (17.5%) reported a bloating stomach, 10% were restless, and a few had headaches (3.7%) and joint/back pain (4%).





**Figure 1.** Health problems faced by females during menstruation  
This pie chart is multiple response, n= 367

## DISCUSSION

This study was performed among female adolescent school children to gather information about their menstrual knowledge, health problems, hygiene practice management. Here, we analyzed respondents' knowledge about menstruation and menstrual hygiene practices to understand the association between these two variables.

Prior awareness of menstruation is generally low in cultures like Nepal, where menstruation is highly stigmatized. This perception was found to be similar in some studies conducted in India<sup>18,19</sup> where lower level of awareness was observed. On the other hand, in contrast to this belief, a study conducted in urban areas<sup>20</sup>, rural Nepal<sup>21</sup> and African regions<sup>22,23</sup> found that majority of the respondents had prior knowledge about menstruation. Our findings also show that more than three-fourths of the

respondents had prior knowledge about mensuration and the information mainly came from their mothers. Studies from some rural parts of India also reported mothers as the foremost source of information on menstruation<sup>24,25</sup>.

Similarly, nine out of ten participants in a study conducted in Northeast Ethiopia had prior information, and the majority of them cited their sisters as the source of information<sup>26</sup>. A previous report based in Chandigarh, India also reported a very high knowledge prevalence, and more than half of the participants cited mothers and sisters as the source of menstrual knowledge<sup>27</sup>. Higher knowledge status in a family coupled with lower levels of apprehension while discussing menstruation with their daughters could be associated with greater literacy levels of the mothers and the presence of sister(s). Almost all of our respondents believed that menstruation is a

normal physiological process occurring in women. This finding is similar to that of studies conducted prior in Nepal<sup>28</sup> and west Ethiopia<sup>29</sup> where participants mainly perceived menstruation as a physiological process.

Menstruation-related health problems are common. Majority of respondents in our study reported health problems like cramps/painful menstrual periods, and mood changes. Meanwhile, few of our respondents reported abdominal pain, backache, and headaches. Our findings are similar to previous studies conducted in Nepal and India, which also reported dysmenorrhea, abdominal pain, and mood swings as the most common problems<sup>19,21,30</sup>.

Schoolgirls frequently experience pain-related absences from class. In contrast to our study, which indicated that more than half of respondents skipped school due to pain and discomfort, a study conducted in Nepal reported only around two out of ten respondents missed school during their periods<sup>20</sup>. The larger percentage of absences from school in our study may be related to adolescent's severe pain and discomfort. However, this was a cross-sectional study, so we were not able to delve deeper into specific health problems.

Regarding the type of material used during menstruation period, the type of hygiene-related practices that women engage in are of utmost importance. The type of absorbent material used can be a source of infection if it is reused, not properly cleaned and stored. The current study found that every four out of five respondents used sanitary pads. Previous studies also reported similar use of sanitary pads<sup>20,31</sup>. However, others reported that the majority of girls used cotton clothing and frequently re-used it after washing<sup>4,5,28</sup>. The lesser use of sanitary pads by the respondents in those studies could be

because of their low socioeconomic status, lesser availability of the pads in the rural areas, and lack of awareness. Moreover, our study also found a correlation between respondents' menstrual knowledge and usage of sanitary pads, further indicating that those who use sanitary pads typically know more about menstruation than non-users.

In a study from West Ethiopia, majority of respondents were found to be changing the menstrual material at least twice each day, compared to half of the respondents in Bhaktapur, Nepal and one-fourth of respondents in the Doti district. Majority of respondents took baths when having their periods, cleaned their genitalia at least 2-3 times a day with soap and water and had access to clean and safe private toilets. The current study's findings were also consistent with these patterns. The study also discovered that, similar to West Ethiopia, respondents predominately disposed their pads in dustbins<sup>20,28,29</sup>. Our findings indicate that the frequency of either cleaning genitalia or cleaning the products used is associated with respondents' menstrual knowledge.

Although some hygiene-related behaviors were associated to knowledge, we cannot generalize this result since we haven't distinguished between good and bad menstrual practices. Therefore, this finding only led us to hypothesize that a higher level of understanding about menstruation may influence the degree of hygiene practiced during menstruation among female students.

## CONCLUSION

In this study we found that menstrual hygiene practices are associated with menstrual knowledge among school going teenagers. The knowledge and understanding of menstruation can be further improved by being aware of need

for information on healthy menstrual habits. Hence, strategies to educate menarche-entering girls about menstruation could be beneficial to avoid menstruation-related health issues and promote menstrual hygiene.

## ETHICAL APPROVAL

The Institutional Review Committee (IRC) of Nobel College gave this study [Ref no: 029] its ethical approval. Participants provided their informed consent to participate before the commencement of the study. Participants' privacy was properly protected.

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## CONFLICT OF INTEREST

The authors declared no conflict of interest.

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