

Comparison of awareness and perception of menstrual hygiene between pre and postmenarchal adolescents of North India: A cross-sectional study

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ABSTRACT

Context: Menstruation is a normal physiologic phenomenon. Due to lack of awareness regarding menstrual hygiene among adolescent girls in India, majority have unhygienic practices which make them vulnerable to various adverse health and social outcomes. **Aims and Objective:** The aim of this study was to compare the awareness and perception of pre- and postmenarchal adolescent girls regarding menstrual hygiene. **Settings and Design:** A hospital-based cross-sectional study was conducted by the Department of Obstetrics and Gynaecology and Paediatrics of a Government tertiary care center, Lucknow, Uttar Pradesh for 6 months from 1 July 2019 to 31 December 2019. **Material and Methods:** The study was undertaken among 120 adolescent girls between 09 and 19 years of age. Premenarchal age group was from 9 to 12 years and postmenarchal was 13-19 years. All the adolescent girls who fulfilled the inclusion criteria were subjected to a pretested prevalidated semi-structured questionnaire assessing their awareness and perceptions regarding menstrual hygiene. **Result:** Of 120 respondents, 43 girls were aware of menstruation prior to attainment of menarche. Mother was the first informant regarding menstruation in the case of 49 (49.65%) girls. A total of 57 girls believed it as a physiological process. 32 (53.3%) girls knew the use of sanitary pads during menstruation. Regarding restrictions practiced, 136 (85%) girls practiced different restrictions during menstruation. **Conclusion:** Adolescent girls, being vulnerable, need to have adequate and correct awareness regarding menstrual hygiene. This will protect them from risk of developing reproductive or sexually transmitted infections (RTI/STI) which is a burden on our society and render many females infertile and cause other adverse health outcomes.

Keywords: Adolescents, attitudes, knowledge, menstrual hygiene, perception

Introduction

Menstruation is a physiological process that stipulates the onset of reproductive life. However, in Indian society, it is often regarded as an impure occurrence due to cultural taboos, insufficient information, and incorrect knowledge among the

adolescent girls which causes unessential limitations in their day-to-day activities.^[1]

Girls' education has a long-term positive impact on personal welfare as well as economic and social development, especially in low-income communities.^[2] Educated girls not only participate in the formal labour market and earn higher incomes but have healthy practices like they get married at a later age, have fewer children, potentially ensuring better health status and education for their children that can reduce poverty and contribute to a country's development. However, a number of small-scale, mostly qualitative studies have

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observed that many school-age girls hesitate in attending school during menstruation due to shame, fear of developing visible stains on their clothes, absence of a private and secured area to handle menstruation in school and dysmenorrhoea.^[3,4]

As adolescent girls are one of the most vulnerable group of the society and are the future mothers, they need to have adequate and correct awareness regarding menstrual hygiene because this will further protect them from risk of developing reproductive or sexually transmitted infections (RTI/STI) which are indeed a burden on our society and render many females infertile and cause other adverse health outcomes. So, if proper awareness is generated at primary level, then, a healthy girl will be a healthy mother in future and will contribute to reducing maternal as well as infant mortality which will result in overall women health empowerment.

Aims and Objectives

The aim of this study was to compare awareness and perception of Pre and Postmenarchal adolescent girls regarding menstrual hygiene and assess the related practices among the postmenarchal females.

Material and Methods

Study design

This was a hospital-based cross-sectional study.

Study Setting

The study was carried out in the Department of Obstetrics and Gynaecology and Paediatrics of a Government tertiary care centre of Lucknow, Uttar Pradesh.

Study Participants

The study was undertaken among the adolescent girls between 09 and 19 years of age. Premenarchal age group was taken from 9 to 12 years and postmenarchal was 13-19 years.

Study Period

This study was carried out for 6 months from 1st July 2019 to 30 December 2019.

Inclusion criteria

All adolescent girls of age 9–19 years who consented to participate in the study were enrolled after informed verbal and written consent.

Exclusion criteria

All girls less than 9 years and above 19 years and those who were not cooperative were excluded.

Sample Size

For the purpose of sample size estimation, finite population correction has been applied to the sample size formula, that is, $n = NX / (X + N - 1)$ where, $X = Z_{\alpha/2} * p (1-p) / d^2$ $Z_{\alpha/2}$ – critical value of the normal distribution at $\alpha/2$, that

is, 1.96, P – Estimated sample proportion, that is, Proportion of adolescent girls with inadequate knowledge about menstrual hygiene (Value is 71%),^[5] d-margin of error for appropriate level of precision (value is 0.08), N–Estimated population size, that is, approximate frequency of adolescent girls attending the hospital during the study period (value is 500). At 95% confidence interval, power of 80%, and 20% as dropouts/nonresponders, the minimum sample size is 120 adolescent girls. Therefore, the study was carried out among 120 adolescent girls. Out of which 60 were in the premenarchal group and the other 60 were in the postmenarchal group.

Ethical Consideration

The ethical permission was taken from Institutional Review Board, IEC of the tertiary care centre (IEC 81/18).

Data Collection

Systematic random sampling was used to enrol the adolescent girls in the study. With sampling interval of two, every second adolescent girl who fulfilled the inclusion criteria was enrolled in either of the groups. Informed verbal as well as written consent was taken from all the adolescent girls. A pretested pre-validated semi-structured questionnaire was prepared to capture all the relevant information regarding their sociodemographic characteristics and knowledge, perceptions and practices regarding menstruation and hygiene.

Variables

The dependent variables in the study were knowledge, perceptions and practices regarding menstrual hygiene. The independent variables include sociodemographic variables like age, religion, type of family and educational status followed by menstrual pattern among postmenarchal females like age at onset of menarche, regularity of menses, amount of flow and duration of flow.

Data Analysis

Data were analysed using SPSS software program, version 24.0. Descriptive summary using frequencies, percentages and cross tabs was used to present the study results. Probability (p) was calculated to test statistical significance at the 5% level of significance. Association between independent and dependent variables was determined using Chi-square test.

Results

Socio-demographic characteristics of the study participants in the two groups

Maximum students in the premenstrual group were early adolescents 10–11 years of age, whereas postmenstrual group had more of late adolescents, that is, between 13 and 19 years. Maximum respondents in both the group were Hindu by religion and lived in joint families. In the premenstrual group maximum participants had received primary education, whereas

Table 1: Socio-Demographic Characteristics of the Study Participants in both the groups

Variable	Pre-menarchal (n=60)	Postmenarchal (n=60)	Chi square	P
Age				
Early Adolescence (9-12 years)	50 (83.3)	07 (11.7)	61.78	0.001*
Late adolescence (13-19 years)	10 (16.7)	53 (88.3)		
Religion				
Hindu	54 (90)	50 (83.3)	1.487	0.581†
Muslim	4 (6.7)	08 (13.3)		
Others	2 (3.3)	02 (3.4)		
Type of Family				
Nuclear	41 (68.3)	50 (83.3)	3.68	0.05
Joint	19 (31.7)	10 (16.7)		
Educational Status				
Illiterate	02 (3.2)	05 (8.3)	68.76	0.001*
Primary	46 (76.7)	02 (3.3)		
Secondary	10 (16.7)	34 (56.7)		
Intermediate	01 (1.7)	15 (25)		
Graduation	01 (1.7)	04 (6.7)		

Number (%), †Yates' corrected P, *P<0.05 is significant

in the postmenstrual group maximum participants had received secondary education [Table 1].

Menstrual pattern of the study participants in the postmenarchal group

Maximum subjects (33.3%) had attained menarche at around 13 years of age. Most of the subjects (80.0%) had regular menses with moderate flow (66.67%) lasting for 4-6 days (41.67%) in the postmenstrual group [Table 2].

Comparison of awareness regarding menstrual hygiene between the two groups

21 people in the premenstrual group and 22 in the postmenstrual group had knowledge of menses prior to the onset of menses. The respondents were aware of the organ from where the bleeding occurred. 9 people in the premenstrual group and 31 in the postmenstrual group thought it was the uterus, 20 people in the premenstrual group and 14 in the postmenstrual group thought it was the stomach, the rest don't know. 24 people in the premenstrual group and 33 in the postmenstrual group thought menses to be a physiological process, 18 people in the premenstrual group and 17 in the postmenstrual group thought it was God-given, the rest did not know.

The first source of knowledge in both the groups were the mothers followed by siblings followed by their peers. Time of first knowledge was same days of menses or the next day. Menstrual hygiene sessions were held in schools of 10 respondents in the premenstrual group and 25 in the postmenstrual group [Table 3].

Comparison of perception regarding menstrual hygiene between the two groups

23 people in the premenstrual group and 34 in the postmenstrual group knew that menstruation was a physiological process, whereas the rest still considered it as a disease or curse from god. Approximately 21 people in the premenstrual group and 33 in the postmenstrual group thought menstruation to be a natural

Table 2: Menstrual Pattern Among the Postmenarchal Females (n=60)

Variable	Frequency (n)	Percentage
Age at Menarche (Year)		
09	01	1.67
10	05	8.33
11	11	18.33
12	06	10.0
13	20	33.33
14	11	18.33
15	06	10.0
Regularity of Menses		
Regular	48	80.0
Irregular	12	20.0
Amount of Flow		
Scanty	03	5.0
Moderate	40	66.67
Heavy	17	28.33
Duration of Flow		
1-3 days	17	28.33
4-6 days	25	41.67
6-8 days	13	21.67
More than 8 days	05	3.33

process, whereas 28 and 12 people in the respective groups took it to be a burden, the rest thought it to be a necessary change, which was statistically significant.

People in both groups follow restrictions like not visiting temples or other religious restrictions, food restrictions, sitting separately, restrictions in doing household work, in walking around or playing. Only 4 people in the premenstrual group and 5 people in the postmenstrual group out of 60 followed no restrictions. 42 out of 60 people in the premenstrual group and 37 people in the postmenstrual group had normal reactions towards the bodily changes that occurred post menarche, whereas the rest were a little depressed.

17 out of 60 in the premenstrual group and 19 out of 60 in the postmenstrual group had to miss school because

Table 3: Comparison of Awareness regarding Menstruation and Hygiene between the Two Groups

Variable	Pre-menstrual (n=60)	Post-menstrual (n=60)	Chi square	P
Knowledge of menses prior to menses				
Yes	21 (35)	22 (36.7)	0.928	0.335
No	39 (65)	28 (63.3)		
Knowledge of organ from where bleeding occurs				
Uterus	09 (15)	31 (51.7)	18.72	0.00008*
Stomach	20 (33.3)	14 (23.3)		
Don't know	31 (51.7)	15 (25)		
Knowledge about cause of bleeding				
Physiological	24 (40)	33 (55)	3.735	0.154
God given	18 (30)	17 (28.3)		
Don't know	18 (30)	10 (16.7)		
Source of first knowledge				
Peer	03 (5)	10 (16.7)	8.53	0.07
Mother	36 (60)	24 (40)		
Sibling	09 (15)	11 (18.3)		
Internet	03 (5)	08 (13.3)		
Teacher	09 (15)	07 (11.7)		
Time of first knowledge				
Prior to menarche	09 (15)	07 (11.7)	4.956	0.175
Same day	24 (40)	22 (36.7)		
Next day	17 (28.3)	11 (18.3)		
Later	10 (16.7)	20 (33.3)		
Menstrual hygiene education session had ever been provided at school				
Yes	10 (16.7)	25 (41.7)	9.076	0.003*
No	50 (83.3)	35 (58.3)		

Number (%), *P<0.05 is significant

of menses and 47 and 27 people in the respective groups avoided standing in class to answer during menses due to risk of staining, which was statistically significant. 28 out of 60 people in the premenstrual group and 47 out of 60 in the postmenstrual group found it difficult to concentrate during menses. 43 people in the premenstrual group and 21 in the postmenstrual group were embarrassed during menses. 17 out of 60 people in the premenstrual group and 5 people in the postmenstrual group perceived those facilities available at school were inappropriate for managing menstrual hygiene [Table 4].

Practices of menstrual hygiene in the post menarchal group

Hygienic practices were followed by 66.67% of participants in the postmenstrual group. 60% of respondents took bath daily during menses. 53.3% respondents used sanitary pads during menses, 20% use cloth and rest 26.7% used both cloth and sanitary pads during menses. 45% of the respondents changed pad thrice a day for hygiene purposes. The pads were not re-used by the majority of respondents; instead, they were disposed-off in dustbins, flushed in toilets, buried in pits or burnt.

53.3% of respondents were comfortable in changing pads in school. 63.3% subjects washed their hands with soap and water after using the sanitary pads. 81.67% had toilet facility at home. People in different age groups had different idea about menstruation [Table 5].

Discussion

The onset of menstruation is the most important phenomena that occurs among girls at adolescence. It is not uncommon that girls have various questions and doubts about menstruation. Imparting correct knowledge about menstruation at the right time, will prevent them from developing inappropriate myths and will avert various adverse genital and urinary infections which poses a huge toll on our primary care physicians. So, menstrual hygiene plays a pivotal role in determining the health status of a woman.

Maximum girls in the premenstrual group were early adolescents, whereas postmenstrual group had more of late adolescents which was in accordance with the study by Alam *et al.*, Gupta *et al.*, Dasgupta *et al.* and Kamath *et al.*^[6-9] Maximum respondents in both the groups were Hindu and lived in joint families, which was similar to the study by Chaudhary N and Gupta MK.^[10]

Majority of the subjects (33.3%) had attained menarche at around 13 years of age, which is in accordance with the study done by Chaudhary N and Gupta MK.^[10] Majority of the subjects had received primary education, this was similar to studies done by Chaudhry N and Gupta and Paria *et al.*^[10,11] Most of the subjects (80.0%) had regular menses with moderate flow (66.67%) lasting for 4-6 days (41.67%) in the postmenstrual group, which was in consistent with the results obtained by Deshpande *et al.*^[12]

Adolescent girls in different age groups had different idea about menstruation. 23 girls in the premenstrual and 34 in the

Table 4: Comparison of Perception about Menstruation and Hygiene between the Two Groups

Variable	Pre-menstrual (n=60)	Post-menstrual (n=60)	Chi square	P
Cause of menses				
Physiology	23 (38.3)	34 (56.7)	4.107	0.2501
Disease	14 (23.3)	10 (16.6)		
Curse from God	12 (20)	09 (15)		
Sin	11 (18.4)	07 (11.7)		
Opinion on menses				
Natural	21 (35)	33 (55)	9.682	0.008*
Burden	28 (46.7)	12 (20)		
Necessary change	11 (28.3)	15 (25)		
Restrictions practised during menses†			-	-
Not visiting temples/religious restriction	20 (33.3)	25 (41.7)		
Food restrictions	25 (41.7)	25 (41.7)		
No touching	0 (0)	01 (1.7)		
Sit separately	05 (8.3)	11 (18.3)		
Restrictions in household work	10 (16.7)	14 (23.3)		
Restriction in playing	11 (18.3)	17 (28.3)		
Instructed not to walk fast/run	04 (6.7)	05 (8.3)		
No restrictions	0 (0)	0 (0)		
Reaction towards menses				
Normal	48 (80)	39 (65)	3.386	0.0657
Depressed	12 (20)	21 (35)		
Reaction towards bodily changes				
Normal	42 (70)	37 (61.7)	0.926	0.3359
Depressed	18 (30)	23 (38.3)		
Does your menses cause you to miss school				
Yes	17 (28.3)	19 (31.7)	2.256	0.1331
No	43 (71.7)	41 (68.3)		
Do you avoid standing in class to answer questions during menses				
Yes	47 (78.3)	27 (45)	14.101	0.0002*
No	13 (21.7)	33 (55)		
Do you find it hard to concentrate during your menses				
Yes	28 (46.7)	47 (78.3)	12.836	0.0003*
No	32 (53.3)	13 (21.7)		
Did you experience embarrassment during your menses				
Yes	43 (71.7)	21 (35)	16.205	0.00005*
No	17 (28.3)	39 (65)		
Perceived that school facilities were inappropriate for managing menstrual hygiene				
Yes	17 (28.3)	05 (8.3)	8.015	0.005*
No	43 (71.7)	55 (91.7)		

Number (%), *P<0.05 is significant, †Multiple response

postmenstrual group knew that menstruation was a physiological process, whereas the rest still considered it as a disease or curse from god, which was similar to the results obtained by Alam *et al.* and Deo *et al.*^[6,13] 28 and 12 girls in the respective groups took it to be a burden, the rest thought it to be a necessary change, which was statistically significant, and in agreement with findings of Deo *et al.*^[13] This clearly indicates that even with advent of free and compulsory education in India for 6-14 years age group, majority of the adolescent girls were deprived of correct knowledge regarding menstrual hygiene and the social stigma further subjects them to more adverse health outcomes.

Adolescent girls in both the groups followed restrictions while menstruating like not visiting temples or other religious places, food restrictions, sitting separately, restrictions in doing household work and in walking around or playing. Only 4 girls in the premenstrual group and 5 in the postmenstrual group, out

of 60, followed no restrictions. However, variable results have been reported by other researchers.^[14-16] In a comparative study by Kumar A and Srivastava K conducted among the adolescent girls of urban slums and urban residential areas of Ranchi, it was observed that 96.07% of girls in urban residential areas reported that they do not face any kind of social restriction during menstruation from parents whereas 45.5% of the girls in the slum reported facing social restriction. Both Hindu and Muslim girls reported restricting themselves from religious practices or worshipping religious places during menstruation.^[17]

42 out of 60 girls in the premenstrual group and 37 girls in the postmenstrual group had normal reaction towards the bodily changes that occurred post menarche, whereas the rest were a little depressed, which was similar to the results obtained by Chaudhry N and Gupta MK.^[10] 17 and 19 girls, out of 60 in the premenstrual and postmenstrual group, respectively,

Table 5: Practices Regarding Menstrual Hygiene in the Postmenarchal Group (n=60)

Variable	Postmenstrual	Percentage
Hygienic practices during menses		
Yes	40	66.6
No	20	33.3
Material used during menses		
Sanitary pad	32	53.3
Cloth	12	20.0
Both	16	26.7
Takes bath daily during menses		
Yes	36	60.0
No	24	40.0
Frequency of changing pad per day		
Once	10	16.7
Twice a day	13	21.7
Thrice a day	27	45.0
More than thrice	10	16.7
Reuse pad		
Yes	12	20.0
No	48	80.0
Disposal of pad		
Throw in dustbin	23	38.33
Bury in pit	10	16.7
Burn	08	13.33
Flush in toilet	11	18.33
Wash & reuse	02	3.33
No response	06	10.0
Satisfactory Cleaning of external genitalia		
Yes	45	75.0
No	15	25.0
Changing pad in school		
Yes	32	53.33
No	28	46.67
Hand washing with soap and water		
Yes	38	63.33
No	22	36.67
Toilet facility at home		
Yes	49	81.67
No	11	18.33

had to miss school because of menses and 47 and 27 girls in the respective groups avoided standing in class to answer during menses due to risk of staining, which was statistically significant, and was consistent with the findings of Chaudhry N and Gupta MK.^[10] Other researchers have also reported that school absenteeism by adolescent girls is strongly related to menstruation.^[6,18] However, conflicting evidence regarding the same also exists. Oster and Thornton collected daily data on school attendance and menstrual calendars and found that menstruation had only limited impact on school attendance. According to them at the beginning of menarche, girls tend to miss school because they are not able to cope well with menstruation.^[19]

43 people in the premenstrual group and 21 in the postmenstrual group were embarrassed during menses, which was in concordance with study by Alam *et al.*^[6] 17 out of 60 girls in the premenstrual group and 5 girls in the postmenstrual group perceived those facilities available at school were inappropriate

for managing menstrual hygiene, which was again in agreement with study of other researchers.^[6,10]

When practices regarding menstrual hygiene were observed among the post menstrual group, it was reported that 60% of the respondents took bath daily during menses, which was also observed by Chaudhary and Gupta and Jothy *et al.*^[10,20] Overall Hygienic practices were followed by 66.67% of the study participants in the postmenstrual group. But a mismatch was observed between the knowledge of the adolescent girls regarding menstrual hygiene in the post menarchal group and their practices. Although only approximately 37% of the girls in post menarchal group had knowledge about menses prior to onset, almost more than two-third (66.67%) practiced menstrual hygiene. Similarly, Singh *et al.*^[21] also observed in his study on menstrual hygiene among rural adolescent girls that there was a difference in the knowledge and practice mean score of participants in the control group for pre and post-intervention group. This can be attributed to the fact that unprepared girls having early menarche showed more negative attitude and beliefs related to menstruation, although if they are aware before onset of menarche, they tend to have better practices.^[22] The positive association between premenarchal preparedness with pleasantness (feeling of grown up and womanhood) and negative association between preparedness to negative attitudes like secrecy, annoyance and worrying thoughts are well supported by other published literature.^[23,24]

53.3% of the respondents used sanitary pads during menses, 20% use cloth and rest 26.7% used both cloth and sanitary pads during menses, which was in accordance with the result obtained by Shah *et al.*^[25] 45% of the respondents changed pad thrice a day for hygiene purposes. The pads were not re-used by the majority of respondents, instead they were disposed-off in dustbins, flushed in toilets, buried in pits or burnt, these results were similar to the results obtained by other researchers also.^[11,12,14] 53.3% of the respondents were comfortable in changing pads in school. 63.3% subjects washed their hands with soap and water after using the sanitary pads, which was also reported by Deshpande *et al.*^[12] 81.67% had toilet facility at home, which was similar to the results obtained by Chaudhry, Gupta and Paria *et al.*^[10,11] In a study by Das *et al.*,^[26] the lack of privacy, unsuitable sanitation facilities and use of cloth as preferred absorbent were key determinants of unhygienic menstrual practices in hostels or tenants place.

Approximately one-third of the adolescent girls in both the premenstrual and postmenstrual group had knowledge of menses prior to the onset of menses. which was consistent with the results obtained by Patle *et al.* and others also.^[8,20,27] The respondents were aware of the organ from where the bleeding occurred. 9 girls in the premenstrual group and 31 in the postmenstrual group thought it was the uterus, 20 girls in the premenstrual group and 14 in the postmenstrual group thought it was the stomach, the rest did not know, and similar findings were reported by Prajapati J and Patel R.^[28]

24 girls in the premenstrual group and 33 in the postmenstrual group thought menses to be a physiological process, 18 girls in the premenstrual group and 17 in the postmenstrual group thought it was god given, the rest did not know as also seen in study by Deo *et al.*^[13] The first source of knowledge in both the groups were the mothers followed by siblings followed by their peers, these results are in accordance with the studies obtained by Chaudhary and Gupta, Patle *et al.*^[10,27] Time of first knowledge was same days of menses or the next day, which was similar to the results obtained by Chaudhry N and Gupta MK.^[10] Menstrual hygiene sessions were held in schools of 10 respondents in the premenstrual group and 25 in the postmenstrual group, which was similar to the results obtained by Alam *et al.* and Thakre *et al.*^[6,29]

Conclusion

71.7 and 35% adolescent girls in the premenarchal and postmenarchal group, respectively, felt embarrassed during menses clearly indicating the social stigma and negative attitude regarding menstruation that exists more among the girls in the premenstrual group. A mismatch was observed between the knowledge of the adolescent girls regarding menstrual hygiene in the post menarchal group and their practices. Although only approximately 37% of the girls in post menarchal group had knowledge about menses prior to onset, almost two-third (66.67%) practiced menstrual hygiene. So, unprepared girls having early menarche showed more negative attitude and beliefs related to menstruation although if they are aware before onset of menarche, they tend to have better practices.

Recommendations

Early education and awareness about menstrual hygiene in pre-menarchal phase will be useful in the postmenarchal phase of life. Strategies to encourage positive social norms towards menstruation such as awareness sessions and counselling of both the adolescent girls and her mother, would help to promote better knowledge among them. Menstrual hygiene should be an integral component of school education system where the adolescent girls can be imparted with adequate and correct information regarding menstruation. Proper IEC material for generating awareness among adolescent girls regarding menstruation and hygienic practices should be displayed in the schools and pamphlets should also be distributed to them in early adolescent phase only.

Declaration of patient consent

The authors certify that they have obtained all appropriate patient consent forms. In the form the patient (s) has/have given his/her/their consent for his/her/their images and other clinical information to be reported in the journal. The patients understand that their names and initials will not be published and due efforts will be made to conceal their identity, but anonymity cannot be guaranteed.

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Conflicts of interest

There are no conflicts of interest.

References

1. Sinha RN, Paul B. Menstrual hygiene management in India: The concerns. *Indian J Public Health* 2018;62:71-4.
2. Bachloo T, Kumar R, Goyal A, Singh P, Yadav S, Bhardwaj A, *et al.* A study on perception and practice of menstruation among school going adolescent girls in district Ambala Haryana, India. *Int J Community Med Public Health* 2016;3:931-7.
3. Mohite R, Mohite V, Kumbhar SM, Ganganahalli P. Common menstrual problems among slum adolescent girls of Western Maharashtra, India. *J Krishna Inst Med Sci Univ* 2013;2:89-97.
4. Alexander KT, Oduor C, Nyothach E, Laserson KF, Amek N, Eleveld A, *et al.* Water, sanitation and hygiene conditions in Kenyan rural schools: Are schools meeting the needs of menstruating girls?. *Water* 2014;6:1453-66.
5. Mahajan A, Kaushal K. A descriptive study to assess the knowledge and practice regarding menstrual hygiene among adolescent girls of Government School of Shimla, Himachal Pradesh. *CHRISMED J Health Res* 2017;4:99-103.
6. Alam MU, Luby SP, Halder AK, Islam K, Opel A, Shoab AK, *et al.* Menstrual hygiene management among Bangladeshi adolescent schoolgirls and risk factors affecting school absence: Results from a cross-sectional survey. *BMJ Open* 2017;7:e015508.
7. Gupta P, Gupta J, Singhal G, Meharda B. Knowledge and practices pertaining to menstruation among the school going adolescent girls of UHTC/RHTC area of Government Medical College, Kota, Rajasthan. *Int J Community Med Public Health* 2018;5:652-6.
8. Dasgupta A, Sarkar M. Menstrual hygiene: How hygienic is the adolescent girl?. *Indian J Community Med* 2008;33:77-80.
9. Kamath R, Ghosh D, Lena A, Chandrasekaran V. A study on knowledge and practices regarding menstrual hygiene among rural and urban adolescent girls in Udipi Taluk, Manipal, India. *Glob J Med Public Health* 2013;2:1-9
10. Choudhary N, Gupta MK. A comparative study of perception and practices regarding menstrual hygiene among adolescent girls in urban and rural areas of Jodhpur district, Rajasthan. *J Family Med Prim Care* 2019;8:875.
11. Paria B, Bhattacharyya A, Das S. A Comparative study on menstrual hygiene among urban and rural adolescent girls of West Bengal. *J Fam Med Prim Care* 2014;3:413-7.
12. Deshpande TN, Patil SS, Gharai SB, Patil SR, Durgawale PM. Menstrual hygiene among adolescent girls-A study from urban slum area. *J Fam Med Prim Care* 2018;7:1439-45.
13. Deo DS, Ghattargi CH. Perceptions and practices regarding menstruation: A comparative study in urban and rural adolescent girls. *Indian J Community Med* 2005;30:33-4.
14. Senapathi P, Kumar H. A comparative study of menstrual hygiene management among rural and urban adolescent girls in Mangaluru, Karnataka. *Int J Community Med Public Health* 2018;5:2548-56.
15. Vashisht A, Pathak R, Agarwalla R, Patavegar BN, Panda M. School absenteeism during menstruation amongst adolescent girls in Delhi, India. *J Fam Community Med* 2018;25:163-8.

16. Dudeja P, Sindhu A, Shankar P, Gadekar T. A cross-sectional study to assess awareness about menstruation in adolescent girls of an urban slum in western Maharashtra. *Int J Adolesc Med Health* 2016;30. doi: 10.1515/ijamh-2016-0079.
17. Kumar A, Srivastava K. Cultural and social practices regarding menstruation among adolescent girls. *Soc Work Public Health* 2011;26:594-604.
18. Miiro G, Rutakumwa R, Nakiyingi-Miiro J, Nakuya K, Musoke S, Namakula J, *et al.* Menstrual health and school absenteeism among adolescent girls in Uganda (MENISCUS): A feasibility study. *BMC Womens Health* 2018;18:4.
19. Oster E, Thornton R. Menstruation, sanitary products, and school attendance: Evidence from a randomized evaluation. *American Economic Journal: Applied Economics* 2011;3:91-100.
20. Jothy K, Kalaiselvi S. Is menstrual hygiene and management an issue for the rural adolescent school girls?. *Elixir Soc Sci* 2012;44:7223-8.
21. Singh A, Gupta V, Agrawal D, Goyal P, Singh M, Lukhmana S. A cross-sectional study to investigate the impact of focused group discussion on menstrual hygiene among rural school girls of Southern Haryana, India. *J Educ Health Promot* 2020;9:260.
22. Tiwari H, Oza UN, Tiwari R. Knowledge, attitudes and beliefs about menarche of adolescent girls in Anand district, Gujarat. *East Mediterr Health J* 2006;12:428-33.
23. Marván ML, Molina-Abolnik M. Mexican adolescents' experience of menarche and attitudes toward menstruation: Role of communication between mothers and daughters. *J Pediatr Adolesc Gynecol* 2012;25:358-63.
24. Shanbhag D, Shilpa R, D'Souza N, Josephine P, Singh J, Goud BR. Perceptions regarding menstruation and practices during menstrual cycles among high school going adolescent girls in resource limited settings around Bangalore city, Karnataka, India. *Int J Collaborative Res Internal Med Pub Health* 2012;4:1353-62.
25. Shah V, Nabwera HM, Sosseh F, Jallow Y, Comma E, Keita O, *et al.* A rite of passage: A mixed methodology study about knowledge, perceptions and practices of menstrual hygiene management in rural Gambia. *BMC Public Health* 2019;19:277.
26. Das S, Mallick A, Bharati P, Biswas S. Effects of menstrual characteristics, symptoms and hygiene-related practices on menstrual experience: A comparative study between freeholder and tenant adolescent schoolgirls of North 24 Parganas, West Bengal, India. *Anthropol Anz* 2020;77:183-93.
27. Patle R, Kubde S. Comparative study on menstrual hygiene in rural and urban adolescent girls. *Int J Med Sci Public Health* 2014;3:129-32.
28. Prajapati J, Patel R. Menstrual hygiene among adolescent girls: A cross sectional study in urban community of Gandhinagar. *J Med Res* 2015;1:122-5.
29. Thakre SB, Thakre SS, Reddy M, Rath N, Pathak K, Ughade S. Menstrual hygiene: Knowledge and practice among adolescent school-girls of Saoner, Nagpur district. *J Clin Diagn Res* 2011;5:1027-33.