

# Menstrual hygiene among adolescent girls – A study from urban slum area

Tanvi Nitin Deshpande<sup>1</sup>, Supriya Satish Patil<sup>1</sup>, Supriti Balaram Gharai<sup>1</sup>,  
S. R. Patil<sup>2</sup>, P. M. Durgawale<sup>1</sup>

Departments of <sup>1</sup>Community Medicine and <sup>2</sup>Microbiology, Krishna Institute of Medical Sciences, Karad, Maharashtra, India

## ABSTRACT

**Background:** Adolescence has been recognized as a special period that requires specific attention as it marks the onset of menarche, an important milestone, and hence good hygienic practices during menstruation are crucial to maintain a healthy life. **Aims and Objectives:** This study was planned to assess knowledge, beliefs, and source of information regarding menstruation, and also to assess hygiene among them. **Materials and Method:** A cross-sectional study was carried out in urban slum area. Data were collected using pre-tested proforma during the period of 1<sup>st</sup> June to 31<sup>st</sup> August 2017. Among the 100 adolescent girls, 72% were between 15 and 19 years. A maximum of 47% were having high school education. About 47% mothers were illiterate; 27% girls had menarche at 14 years and 82% had regular cycles. About 76% had no knowledge of menses before menarche. The source of information was mother in 84%. Only 16% girls commented that bleeding initiated in uterus. About 60% girls used sanitary pad and the rest used cloth pieces. About 22% used water and no soap for hand washing. Multiple restrictions were practiced. **Conclusion:** This study reported that menstrual hygiene was unsatisfactory among adolescent girls. Therefore, girls should be educated about the facts of menstruation and proper hygienic practices.

**Keywords:** Hygiene, menarche, menstrual, slum

## Introduction

Menstruation (a period) is an exceptional phenomenon that the nature has planned for women. It is not just a small term but a major stage where a woman undergoes certain reproductive changes from onset of menstruation (menarche) till menopause. Adolescence is the stage of physical, psychological, and reproductive development that generally occurs during the period from puberty to legal adulthood. The World Health Organization defines adolescence as individuals between 10 and 19 years of age.<sup>[1]</sup> Adolescence in girls has been recognized as a special period in their life cycle that requires specific and special attention. This period is marked with onset of menarche.<sup>[2]</sup>

Menstruation is surrounded by various psychological and religious barriers due to lack of knowledge about the scientific process of menstruation. Many girls residing in slum areas are unaware of what actually happens during menstrual cycle. Although menstruation is a natural process, it is linked with several perceptions and practices within the community, which sometimes may result in adverse health outcomes.<sup>[3]</sup>

Hygiene during menstruation is an inevitable part of woman's life. Various aspects such as physiology, pathology and psychology of menstruation have been found to associate with health and well-being of women; hence, it is an important issue concerning morbidity and mortality of female population.<sup>[4]</sup> It is during this period a woman is regarded most vulnerable for developing any kind of reproductive tract infections, urinary tract infections, and various sexually transmitted diseases. Menstrual hygiene deals with special healthcare needs and requirements of women

**Address for correspondence:** Dr. Supriya Satish Patil,  
Department of Community Medicine,  
Krishna Institute of Medical Sciences, Karad, Maharashtra, India.  
E-mail: patil.dr.supriya@gmail.com

### Access this article online

#### Quick Response Code:



**Website:**  
www.jfmipc.com

**DOI:**  
10.4103/jfmipc.jfmipc\_80\_18

This is an open access journal, and articles are distributed under the terms of the Creative Commons Attribution-NonCommercial-ShareAlike 4.0 License, which allows others to remix, tweak, and build upon the work non-commercially, as long as appropriate credit is given and the new creations are licensed under the identical terms.

**For reprints contact:** reprints@medknow.com

**How to cite this article:** Deshpande TN, Patil SS, Gharai SB, Patil SR, Durgawale PM. Menstrual hygiene among adolescent girls – A study from urban slum area. J Family Med Prim Care 2018;7:1439-45.

during monthly menstruation or menstrual cycle.<sup>[5]</sup> Therefore, increased knowledge about menstruation right from childhood may escalate safe practices and may help in mitigating the suffering of millions of women.<sup>[3]</sup>

Menstrual hygiene management should be an imperative part of healthcare. The United Nations defines adequate menstrual hygiene management as “women and adolescent girls using a clean menstrual management material to absorb or collect blood that can be changed in privacy as often as necessary for the duration of the menstruation period, using soap and water for washing the body as required, and having access to facilities to dispose of used menstrual management materials.”<sup>[6]</sup> Particularly in poor countries, girls and women face substantial barriers to achieving adequate menstrual management.<sup>[7]</sup>

Teachers leave a positive impact and greatly influence the minds of children. But the issue of menstrual hygiene is seldom being discussed in the school curriculum. It is also included in Millennium Development Goals. Therefore, to understand the consequences and importance of menstrual hygiene practices among adolescent girls, it is important to study the current practices about the same so that future interventions can be planned accordingly.<sup>[8]</sup>

With this backdrop, a study was conducted among adolescent girls in the urban slum area to assess the knowledge, beliefs, source of information, practices of menstrual hygiene, and menstrual pattern and problems and also to identify status of hygiene and the restrictions practiced by adolescent girls during menstruation.

## Materials and Method

A community-based cross-sectional study was carried out in field practice area of the Department of Community Medicine, Krishna Institute of Medical Sciences, Karad, Maharashtra. The study was undertaken among the adolescents girls between 10 and 19 years of age in the field area of Aagashivnagar. This study was carried out in a period of 3 months from 1<sup>st</sup> June 2017 to 31<sup>st</sup> August 2017. The sample size was calculated using the formula  $4pq/l^2$ , where  $P$  is the prevalence of unhygienic practices = 48.75%<sup>[9]</sup> and  $l$  is the allowable error, that is

$$\begin{aligned} \text{Sample size } N &= 4pq/l^2 \\ &= 4 \times 48.75 \times 51.25/(10)^2 \\ &= 100 \end{aligned}$$

Therefore, this study was carried out among 100 adolescent girls.

Data were collected by house-to-house survey in the community, and girls were asked questions using a predesigned, pretested questionnaire specially designed for this purpose. The questionnaire consisted of sociodemographic details, knowledge about menstruation, menstrual patterns and practices, hygiene followed, and finally any restrictions followed during

menstruation. Before the interview, a verbal informed consent was obtained from the parent or guardian of the adolescent girl and ascent was taken from adolescent girl. All the respondents were assured that the information collected would be confidential throughout the study. At the end of the interview, the girls were educated about facts of menstruation and explained about cleanliness during menses. In addition, all their queries were answered satisfactorily.

## Statistical analysis

Data were fed to Microsoft Excel 2007 and were analyzed in the form of proportions.

## Results

This study was conducted among 100 adolescent girls from urban slum area of Karad. Age-wise distribution showed that a maximum 72% of girls belonged to late adolescent group of 15–19 years and 28% belonged to early adolescent group of 10–14 years.

Religion-wise, 75% were Hindus followed by 25% Muslims. The 77% girls mostly belonged to nuclear family and 23% to joint family [Table 1].

Table 2 depicts that a maximum of 47% of girls were educated up to higher secondary (8<sup>th</sup>–10<sup>th</sup> std.), followed by 32% secondary school (5<sup>th</sup>–7<sup>th</sup> std.), intermediate (11<sup>th</sup>–12<sup>th</sup> std.) were 11%, primary 7%, and 3% were found to be illiterate. But 45% of the girls were found to be school dropouts.

It was observed that a majority of 47% of mothers were illiterate and 42% had only primary education. The fathers of 44% of girls were found to be educated up to primary school majorly followed by 37% up to secondary school.

Table 3 shows occupation-wise distribution where it was found that majorly 57% of the fathers and 91% of the mothers had unskilled occupation; 22% fathers and 9% mothers had semi-skilled occupation; 21% fathers had skilled occupation, whereas no mothers were found to have skilled occupation.

**Table 1: Distribution of Study population according to socio-demographic factors**

	Number	Percentage
Age		
Early Adolescence (10-14 years)	28	28
Late Adolescence (15-19 years)	72	72
Religion		
Hindu	75	75
Muslim	25	25
Type of Family		
Nuclear	77	77
Joint	23	23

Table 4 shows that the maximum number of girls had their menarche at 14 years (27%) and 13 and 12 years (25%). The mean age of menarche was 13.13 years. The menses were irregular in 18% girls, whereas 82% had regular menses. The amount of blood flow was scanty in 33% individuals, whereas the majority 65% had moderate blood flow. The duration of blood flow was found to be between 4 and 6 days in majority (78%) of the girls followed by 1–3 days (18%). Only 2% of the girls were found to have menorrhagia and about 40% had dysmenorrhea.

Table 5 shows that the majority of the girls (76%) had no knowledge of menstruation before menarche, and 84% obtained information of menses from their mother. Only 16% of the girls knew that bleeding occurs from the uterus, whereas 84% had no idea of the organ from where bleeding occurs. Very less number of girls (20%) were found to know that the cause of menses is physiological, and the maximum (76%) were not aware of anything.

**Table 2: Education wise distribution**

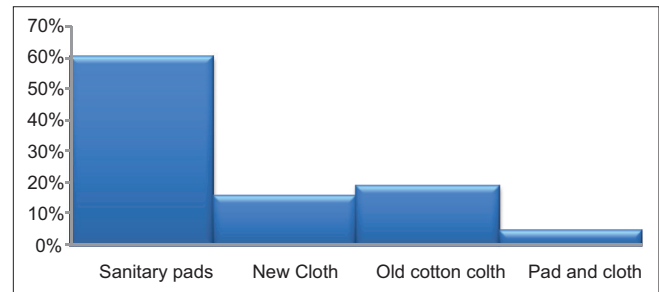
	Number	Percentage
Education of Adolescent Girl		
Illiterate	3	3
Primary	7	7
Secondary	32	32
Higher Secondary	47	47
Intermediate	11	11
Education of Mother		
Illiterate	47	47
Primary	42	42
Secondary	7	7
Higher Secondary	4	4
Intermediate	0	0
Graduate	0	0
Education of Father		
Illiterate	8	8
Primary	44	44
Secondary	37	37
Higher Secondary	10	10
Intermediate	1	1
Graduate	0	0
School Dropout		
Yes	45	45
No	55	55

**Table 3: Occupation wise distribution**

	Number	Percentage
Occupation of Father		
Unskilled	57	57
Semi-skilled	22	22
Skilled	21	21
Occupation of Mother		
Unskilled	91	91
Semi-skilled	9	9
Skilled	0	0

Figure 1 shows that 60% of the girls used sanitary pad, about 19% used old household cotton, while 16% bought new cloth from the market, and only a 5% used both pad and cloth. Table 6 shows that of 60 girls who used sanitary pad, 63.34% of the girls changed the pad frequently (>3 times/day). About 70% washed the same cloth and reused it for more than three times.

Sanitary pads were wrapped in paper and disposed by 51.67% of the girls. But an unusual practice of washing the sanitary



**Figure 1: Methods used during menstruation**

**Table 4: Pattern of Menstruation among study population**

	Number	Percentage
Age at Menarche (years)		
10	1	1
11	8	8
12	25	25
13	25	25
14	27	27
15	14	14
Regularity of Menses		
Regular	82	82
Irregular	18	18
Amount of Flow		
Scanty	33	33
Moderate	65	65
Heavy	2	2
Duration of Flow		
1-3 days	16	16
4-6 days	78	78
6-8 days	4	4
>8 days	2	2

**Table 5: Knowledge of adolescent girls on menstruation**

	Number	Percentage
Knowledge of Menarche prior to Menstruation		
Yes	24	24
No	76	76
Knowledge of organ from where bleeding occurs		
Uterus	16	16
Don't Know	84	84
Knowledge of Cause of Bleeding		
Physiological	20	20
God given	3	3
Don't know	76	76

pad and then disposing it in a carry bag was observed in our study. About 30% girls used this method of disposal and 18.4% disposed their pads in open.

All the girls practiced hand washing during menses. They used soap and water in majority (78%), but a few (22%) used only water to wash. Bathing everyday was found in almost all the girls and washing of private parts during menses was practiced by them during bathing. Any special attention to genital hygiene was not found in them. Some of the girls (4%) practiced hair washing everyday during menses.

Table 7 shows that only few (20%) of the girls did not follow any restrictions, whereas a majority of them had restrictions. Few (27%) believed that the restrictions imposed on them are by Gods commands. Almost a maximum (80%) of girls did not visit temple during menses, separation from the family members and not entering the kitchen was found in 27% girls, whereas some (21%) girls said that they were not allowed to touch anyone and had to stay out of the house during menses.

Table 8 shows that 85% girls had continuous water supply in the house, whereas 15% had intermittent. This study being carried out in slum area, poor environmental sanitation was observed. The surrounding of the houses was found to be dirty in almost all houses. The maximum of 79% of girls used common public toilet and 21% had separate private toilet in the house. About 65% of the girls lived in kaccha housing and 35% lived in pucca house.

## Discussion

This study shows that the age of menstruating girls ranged from 10 to 19 years with a maximum number of girls, that is, 72% found between the age group of late adolescents (15–19 years) which was similarly observed in a study in Kolkata where 57% girls belonged to 15–19 years age group,<sup>[9]</sup> and in another study conducted by Jain *et al.* 67.55% girls were between 14 and 16 years.<sup>[10]</sup> In our study, a majority of 75% of the girls were Hindus, whereas in a study by Omidvar and Begum 90.2% girls were Hindus.<sup>[11]</sup> The type of the family highly influenced the status of hygiene. Hence, the family type of the girl was also considered and 77% girls belonged to nuclear family which was comparable to a study where 70.6% of girls belonged to nuclear family.<sup>[8]</sup> A significant number of girls were school dropouts; it was the mother who was the person responsible in delivering knowledge. Therefore, educational status of the mother played a crucial role in influencing the adolescent girl in the family, and it was found that a majority of 47% of the mothers were illiterate, while in a study conducted among school-going adolescent girls in Nagpur only 7.49% of the mothers were illiterate.<sup>[12]</sup> This wide difference was because this study was carried out in a slum area. Another community study in Varanasi showed that 13% of the mothers were illiterate and were less hygienic.<sup>[13]</sup>

The mean age of menarche of participants was 13.13 years, while a study at Haryana and other conducted by Sharma *et al.* showed

**Table 6: Practices of menstrual hygiene**

	Number	Percentage
Frequency of Using same used cloth		
Infrequent	12	30
Frequent	28	70
Frequency of changing pad		
Infrequent	22	36.67
Frequent	38	63.34
Disposal of Pad		
Open	11	18.34
Washing of Pad	18	30
Paper wrapped	31	51.67
Hand washing with water	22	22
Hand washing with water and Soap	78	78

**Table 7: Restrictions practiced during menstruation**

Restrictions	Number	Percentage
Not visiting temple	80	80
Sit separate	27	27
No Kitchen	27	27
No touching	21	21
No restriction	20	20

**Table 8: Distribution of data according to environmental conditions**

	Number	Percentage
Water Supply		
Continuous	85	85
Intermittent	15	15
Toilet		
Common Public	79	79
Separate	21	21
Housing		
Kaccha	65	65
Pucca	35	35

the mean age to be  $12.21 \pm 1.70$  and 12.8 years, respectively.<sup>[4,14]</sup> The pattern of menstruation including the regularity of menses, amount of flow, and length of the menstrual cycle was also analyzed, and it was observed that 82% of the girls had regular menstrual cycle with a majority of 65% with moderate flow while 18% had irregular cycles which was comparable to a study carried out in Amravati district where most of the girls (78.2%) had regular menstrual cycle and 21.8% had irregular cycle, while in a study by Jaikhani *et al.* 75.7% girls had regular menses and 24.3% had irregular menses.<sup>[15,16]</sup> The duration of menstrual flow in our study was 4–6 days for 78% girls, whereas in a study by Mathiyalagen *et al.* 76.9%<sup>[17]</sup> girls had bleeding for 3–5 days and in a study by Kanotra *et al.* the duration of menstrual flow was within 5 days in 96.3% of girls and 3.7% had prolonged menses (>5 days).<sup>[18]</sup> Dysmenorrhea is the most common menstrual problem, Many of the adolescent girls have abdominal pain, back pain, and abdominal cramps. It is the most disturbing health problem faced by young women with ovulatory cycles. In this study, dysmenorrhea was experienced by 40% girls, while



the prevalence of dysmenorrhea was found to be 61% in a study at Chennai.<sup>[19]</sup>

As the adolescent girls lived in slum areas and the majority of the girls were school dropouts, their knowledge about menstruation was very poor. The girls in majority were unaware of the scientific basis and physiology of process of menstruation. Only 24% girls were aware of the term menstruation before menarche. Mother was the first informant in 84% cases. This is expected as mothers are usually the closest confidant teacher of most of the growing adolescent girls in our environment. Whereas in a study conducted by Dudeja *et al.* 56.4% girls were aware of the process of menstruation before menarche and 60.7% girls revealed mother as their source of information while 31.8% declared that they obtained information from their friends.<sup>[20]</sup> Other sources of information were sisters, friends, and relatives. A study in Ethiopia reported teacher to be the first source of information in 43.1% of girls.<sup>[21]</sup> The adolescent girls had limited knowledge about the reproductive system of human body, and hence it was very sad to observe in this study that 84% of girls did not know about the organ from where menstrual bleeding initiates. Only 16% of the girls could comment uterus as the bleeding organ which was in accordance to a research done by Prajapati *et al.* in which 17% girls could identify uterus to be the origin of bleeding.<sup>[22]</sup> In Nigeria, 22.37% of girls commented that bleeding originates in the uterus.<sup>[23]</sup> In another study by Juyal *et al.*, 29.1% of the girls were having knowledge about the reproductive system as the source of bleeding.<sup>[24]</sup> It was observed in this study that 20% of girls believed it to be a physiological process and 76% were unaware of the reasons for menstruation which was found similar to a study by Misra *et al.* as stated by 62%.<sup>[25]</sup>

Unhygienic and improper practices during this period can lead to serious reproductive tract infections, urinary tract infections, and various sexually transmitted diseases. It can also contribute to developing life-threatening conditions such as cervical cancer. In this study, about 60% of the girls used sanitary pad, whereas 19% used old cotton cloth. Similarly, in a study in Delhi, 63.3% of the girls used sanitary pads, whereas cloth was used by 25.3%. The practice of using pads was found less than that reported from a study by Patavegar *et al.* in which 85.92% used sanitary pads.<sup>[26]</sup> Many of the girls preferred cloth pieces and the usual practice was washing the cloth pieces and then drying them in the sun in a private area so that nobody can see them. Among those who used cloth pieces, the frequency of washing or reusing the cloth is an important contributor to reproductive tract infections. Therefore, in this study, 70% of the girls reused the same old cloth after washing, whereas it was 51.3% in one of the study.<sup>[21]</sup> In a study conducted among girls in Kenya, cotton wool, plastic bags, mattresses, dried leaves, cow dung, and paper from school classrooms were used.<sup>[27]</sup>

The adolescent girls had no information about proper method of disposal of sanitary pad. In our study, only 51.67% of the girls used proper disposal technique of wrapping the sanitary pad with paper and then throwing it into a dustbin which was similar

to a study where 57.5% of girls disposed the pad properly.<sup>[28]</sup> Personal hygiene practices such as hand washing, bathing, and cleaning private parts regularly play a vital role in safeguarding oneself from infections. Simple hand washing with soap and water during period of menstruation and after using toilet can be beneficial. In our study, hand washing with only water was found in 22% of girls, whereas 78% of girls used soap and water which was found to be similar to a study in which 28.5% girls used only water and 71.5% used both soap and water for hand washing.<sup>[8]</sup> In another study by Patle and Kubde, 43.75% of the urban girls and 61.96% of the rural girls used water and 56.25% of urban girls and 38.04% of rural girls used both soap and water to wash hands.<sup>[29]</sup>

Different restrictions were practiced by most of the girls in this study due to their false beliefs and improper perceptions about menstruation. Traditional practices and superstitions are followed due to lack of knowledge among adolescent girls and their families. Multiple restrictions were followed by every adolescent girl which included not visiting temples and not entering kitchen. Restrictions such as separation from the family during menstrual bleeding, not touching anyone in the family, and sleeping outside the house were also found to be practiced. Almost every girl followed some or the other restrictions. In another study carried out in slum and non-slum areas by Rokade and Kumavat, 77% of girls from slum area and 76.61% of girls from non-slum area practiced various types of restrictions, and the commonest restriction reported in both the groups was related to religious activity – 68% in slum and 70.16% in non-slum girls.<sup>[30]</sup>

This study being community-based study in slum area, unhygienic environmental conditions were observed. Poverty, illiteracy, and ignorance are the major factors which lead to poor environmental sanitation. Improper sanitation of the surrounding also contributes to adverse health outcomes. Lack of water supply majorly affects the status of hygiene. Privacy issues are mainly found in girls using public toilets. Hence, ignorance toward cleanliness is seen in these girls to avoid embarrassment. Girls using private toilets were found to practice better hygiene than those using common public toilets. Therefore, in our study a majority of 79% of girls used common public toilet and only 21% had separate individual toilets, while in a study by Yasmin *et al.*, 80.3% of the respondents had private toilet and 19.7% girls used common public toilet.<sup>[3]</sup>

## Conclusion

Menstruation is an important indicator of reproductive health and development, thus menstrual hygienic practices are of major concern. This study revealed that menstrual hygiene was unsatisfactory among adolescent girls. This was because of low level of education and improper assumptions about the phenomenon of menstruation. Hence, it is very crucial to educate girls about the physiological facts of menstruation, wipe off false taboos, and lead them to proper hygienic practices to safeguard themselves against reproductive tract infections.

Various schools, Anganwadi health centers, social welfare foundations, and nongovernment organizations should stand to disseminate awareness about menstrual hygiene, pattern, and problems. In our study, since the majority of the girls were school dropouts, knowledgeable parents play a vital role in implementing hygienic practices among adolescent girls. It is a strong belief that an educated woman is a first teacher of a family, that is why education of the mother and the adolescent girl is very important. But presently, as we live in a male-dominated society, educating men about basic needs of women of his family during menstruation will help in contributing toward cleaner and healthier menstrual practices.

Therefore, when the whole family is in acquaintance with the phenomenon of menstruation, age old restrictions, traditional perceptions, false beliefs, and wrong attitude can be effectively eliminated.

### Financial support and sponsorship

Nil.

### Conflicts of interest

There are no conflicts of interest.

### References

- Ghai OP, Paul VK, Bagga A. Essential Pediatrics. 7<sup>th</sup> ed. New Delhi: CBS Publishers and Distributors Pvt Ltd; 2009.
- Improvement in Knowledge and Practices of Adolescent Girls Regarding Reproductive Health with Special Emphasis on Hygiene during Menstruation in Five Years. National Institute of Public Cooperation and Child Development; 2014.
- Yasmin S, Manna N, Mallik S, Ahmed A, Paria B. Menstrual hygiene among adolescent school students: An in-depth cross-sectional study in an urban community of West Bengal, India. *IOSR J Dent Med Sci* 2013;5:22-6.
- Bachloo T, Kumar R, Goyal A, Singh P, Yadav SS, 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.
- Barathalakshmi J, Govindarajan PK, Ethirajan N, Felix AJ. Knowledge and practice of menstrual hygiene among school going adolescent girls. *Natl J Res Commun Med* 2014;3:138-42.
- Sommer M, Sahin M. Overcoming the taboo: Advancing the global agenda for menstrual hygiene management for school-girls. *Am J Public Health* 2013;103:1556-9.
- Kuhlmann AS, Henry K, Wall LL. Menstrual hygiene management in resource-poor countries. *Obstet Gynecol Surv* 2017;72:356-76.
- Sharma S, Mehra D, Kohli C, Singh MM. Menstrual hygiene practices among adolescent girls in a resettlement colony of Delhi: A cross-sectional study. *Int J Reprod Contracept Obstet Gynecol* 2017;6:1945-51.
- Sudeshna R, Aparajita D. Determinants of menstrual hygiene among adolescent girls: A multivariate analysis. *Natl J Community Med* 2012;3:294-301.
- Jain R, Anand P, Dhyani A, Bansai D. Knowledge and awareness regarding menstruation and HIV/AIDS among schoolgoing adolescent girls. *J Family Med Prim Care* 2017;6:47-51.
- Omidvar S, Begum K. Menstrual pattern among unmarried women from south India. *J Nat Sci Biology Med* 2011;2:174.
- Thakre SB, Thakre SS, Reddy M, Rathi 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.
- Kansal S, Singh S, Kumar A. Menstrual hygiene practices in context of schooling: A community study among rural adolescent girls in Varanasi. *Indian J Community Med* 2016;41:39-44.
- Sharma R, Negi S, Kunj D, Sharma V. Menstrual hygiene among adolescent girls. *Indian J Commun Health* 2015;27:376-80.
- Wasnik VR, Dhumale D, Jawarkar AK. A study of the menstrual pattern and problems among rural school going adolescent girls of Amravati district of Maharashtra, India. *Int J Res Med Sci* 2015;33:1252-6.
- Jailkhani SM, Naik JD, Thakur MS, Langre SD, Pandey VO. Patterns & problems of menstruation amongst the adolescent girls residing in the urban slum. *Sch J App Med Sci* 2014;2:529-34.
- Mathiyalagen P, Peramasamy B, Vasudevan K, Basu M, Cherian J, Sundar B. A descriptive cross-sectional study on menstrual hygiene and perceived reproductive morbidity among adolescent girls in a union territory, India. *J Family Med Prim Care* 2017;6:360-5.
- Kanotra S, Bangal V, Bhavthankar D. Menstrual pattern and problems among rural adolescent girls. *Int J Biomed Adv Res* 2013;4:551-4.
- Sharanya T. Reproductive health status and life skills of adolescent girls dwelling in slums in Chennai, India. *Natl Med J India* 2014;27:305-10.
- 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. *International J Adolescent Medicine Health* 2016.
- Gultie T, Hailu D, Workineh Y. Age of menarche and knowledge about menstrual hygiene management among adolescent school girls in Amhara province, Ethiopia: Implication to health care workers & school teachers. *PLoS One* 2014;9:e108644.
- Prajapati J, Patel R. Menstrual hygiene among adolescent girls: A cross sectional study in urban community of Gandhinagar. *JMR* 2015;1:122-5.
- Fehintola FO, Fehintola AO, Aremu AO, Idowu A, Ogunlaja OA, Ogunlaja IP. Assessment of knowledge, attitude and practice about menstruation and menstrual hygiene among secondary high school girls in Ogbomoso, Oyo state, Nigeria. *Int J Reprod Contracept Obstet Gynecol* 2017;6:1726-32.
- Juyal R, Kandpal SD, Semwal J, Negi KS. Practices of menstrual hygiene among adolescent girls in a district of Uttarakhand. *Indian J Commun Health* 2012;24:124-8.
- Misra P, Upadhyay RP, Sharma V, Anand K, Gupta V. A community-based study of menstrual hygiene practices and willingness to pay for sanitary napkins among women of a rural community in northern India. *Natl Med J India* 2013;26:335-7.

26. Patavegar BN, Kapilashrami MC, Rasheed N, Pathak R. Menstrual hygiene among adolescent school girls: An in-depth cross-sectional study in an urban community. *Int J Health Sci Res* 2014;4:15-21.
27. Jewitt S, Ryley H. It's a girl thing: Menstruation, school attendance, spatial mobility and wider gender inequalities in Kenya. *Geoforum* 2014;56:137-47.
28. Dasgupta A, Sarkar M. Menstrual hygiene: How hygienic is the adolescent girl? *Indian J Commun Med* 2008;33:77.
29. Patle RA, Kubde SS. Comparative study on menstrual hygiene in rural and urban adolescent. *Int J Med Sci Public Health* 2014;3:129-32.
30. Rokade HG, Kumavat AP. Study of menstrual pattern and menstrual hygiene practices among adolescent girls. *Natl J Community Med* 2016;7:398-403.