

## Research Article

# Are Menstrual Knowledge Outcome Scores Similar Among Rural and Urban Girls?

Shaili Vyas<sup>1\*</sup>, Deepshikha<sup>1</sup>, Syed Esam Mahmood<sup>2</sup>, Parul Sharma<sup>3</sup>, Kajal Srivastava<sup>3</sup> and Shrotriya VP<sup>4</sup>

<sup>1</sup>Assistant Professor, Department of Community Medicine, HIMS, HIHT University, India

<sup>2</sup>Assistant Professor, Department of Community Medicine, Government Medical College, Ambedkar Nagar, UP, India

<sup>3</sup>Associate Professor Department of Community Medicine, Dr. D.Y. Patil Medical College, Pune, Maharashtra, India

<sup>4</sup>Professor, Department of Community Medicine, SRMSIMS, Bareilly, India

Received date: July 01, 2015; Accepted date: June 06, 2017; Published date: June 14, 2017

## ABSTRACT

**Background:** Adolescent girls constitute a vulnerable group particularly in India where menstruation is still regarded as something dirty and messy. The cultural and social influences appear to be hurdle for advancement of knowledge of the subject. This results in adverse health outcomes in these adolescent girls. Awareness about menstruation and hygienic practices followed during menstruation are of immense importance as it has a health impact in terms of increased vulnerability to reproductive tract infection.

**Aim:** a) To assess and compare the knowledge regarding menstruation in rural and urban adolescent girls. b) To associate the findings with the selected socio-demographic variables.

**Subjects and methods:** A community based, cross sectional study was undertaken among 715 adolescent schools going girls in the field practice area of the RHTC and UHTC of Department of Community Medicine, District Bareilly. A pre-designed, pretested structured questionnaire was used in the study regarding knowledge and perception of the school going girls regarding menstruation.

**Results:** Majority of the girls had first heard of menstruation and acquired knowledge related to it before attaining menarche (72.45%). The major source of information was from their mothers and sisters (60.6%). Maximum number of girls was not aware of the source of bleeding (53.7%). Statistically significant difference with knowledge scores was seen in girls of higher standards, maternal literacy and father's occupation.

**Conclusion:** Several factors are known to influence menstrual behaviour, the most significant being maternal literacy and father's occupation. Imparting knowledge about menstruation and safe practices during menstruation is necessary to mitigate the suffering of adolescent girls. Therefore promoting positive attitudes towards management of menstruation and related problems among the adolescent girls is the need of the hour.

**Keywords:** Menstruation, Knowledge, Perception

## INTRODUCTION

Menstruation is generally considered as unclean in the Indian society" [1]. In many parts of developing countries, including India, a culture of silence surrounds the topic of menstruation and related issues; as a result many young girls lack appropriate and sufficient information regarding menstrual hygiene. This may result in incorrect and unhealthy practices during their menstrual period [2].

"There is a substantial lacuna in the knowledge about menstruation among adolescent girls" [3]. Several research studies have revealed this gap which showed that there was a low level of knowledge about menstruation among the girls when they first experienced it [4-6]. Social prohibitions and the negative attitude of parents in discussing the related issues openly, have blocked the access of adolescent girls to the right kind of information, especially in the rural and tribal

### Corresponding Author:

Shaili Vyas, C-1/1, HIHT Campus, Swami Ram Nagar, Dehradun, Uttarakhand, India, Tel: 9759135362/9454593210; E-mail: shailivyas7@gmail.com

### DOI:

10.4103/2278-960X.194486

This is an open access article distributed under the terms of the Creative Commons Attribution-NonCommercial-ShareAlike 3.0 License, which allows others to remix, tweak, and build upon the work non-commercially, as long as the author is credited and the new creations are licensed under the identical terms.

For reprints contact: editor@jbcrs.org

**Copyright:** © 2017 Vyas et al. This is an open-access article distributed under the terms of the Creative Commons Attribution License, which permits unrestricted use, distribution, and reproduction in any medium, provided the original author and source are credited.

communities [7]. Many studies have revealed that most of the adolescent girls had incomplete and inaccurate information about the menstrual physiology and hygiene [3,7]. Also, many mothers lack correct information and skills to communicate about menstrual hygiene which they pass on to their children, leading to false attitudes, beliefs and practices in this regard [8]. Collective knowledge of age at menarche, menstrual cycle and duration of menstrual flow in adolescent girls is also useful for allaying fears and psychological trauma that may arise from an unexpected appearance of blood per vagina at menarche. In addition, sufficient knowledge of menstruation is expected to empower the adolescents to delineate between physiological and abnormal uterine bleeding. Furthermore, it is a well-known fact that adolescence is a period of increased risk-taking and therefore susceptibility to behavioural problems at the time of puberty [9]. It was therefore considered relevant to investigate menstruation related knowledge among the school going adolescent girls in rural as well as urban slum areas of District Bareilly.

## Objectives

To assess and compare the knowledge regarding menstruation in rural and urban adolescent girls.

To elicit the sources of information of their knowledge in rural and urban settings.

To associate the findings with the selected sociodemographic variables.

## SUBJECTS AND METHODS

The present community based cross sectional study was conducted in randomly selected rural and urban Inter colleges of District Bareilly. For this, lists of all Intercollege under RHTC and UHTC were prepared separately for both urban and rural areas and then Intercollege were selected from both the lists by simple random sampling technique. The research protocol was approved by the Institutional Ethics Committee, prior to the conduction of the study.

### Study tool

The study tool used was a pre-designed, pre-tested, self-administered questionnaire which was developed and translated into local language. Tool of data collection was designed based on recent relevant literature and was administered to the school going girls to study their existing level of knowledge and beliefs regarding menstruation.

### Study participants

A total of 715 school going girls, 421 from the rural area, 294 from urban area were included in this study

## METHODOLOGY

Assuming menstrual problems in urban and rural girls' to be 50% (based on pilot study findings), 400 girls were sufficient to estimate the true proportion in the study population with a 10% relative precision and 95% confidence interval. In order to compare the prevalence of menstrual problems in both rural and urban areas, one inter college was randomly selected from the rural area and one from urban area. The school authorities were contacted and informed about the nature and objective of the study. After obtaining the permission from the school authorities, the investigators visited the school as per pre-planned schedule for interviewing the adolescent girls. Inclusion into the study was entirely on a voluntary basis and female students who had attained menarche were eligible to participate in the study. The adolescent girls were explained about the purpose of the study, and assured of confidentiality of the information collected so as to obtain reliable answers from them. The pre-designed, pretested self-administered questionnaire included topics which were related to their awareness perceptions and sources of information regarding menstruation. Care was taken to ensure privacy and confidentiality. Before distributing the questionnaire and seeking informed verbal consent, the purpose of the study and contents of the questionnaire were explained to the students. The participants were made comfortable by maintaining anonymity in the questionnaire administered to them. They were also ensured confidentiality that their data will be used only for the purpose of the study. After ensuring confidentiality, students were given 45 min to complete the questionnaire without mutual consultation under the supervision of the investigator. Health Education related to personal and menstrual hygiene was also being given after the interview. The data collected was entered into Microsoft Excel and analysed using standard statistical packages. The students' knowledge and beliefs were scored using a system adopted from previous studies [10-11]. A score of 1 was given to the correct answer, and a score of (0) for the wrong or missed answers. The total knowledge score was obtained for each student (0-6). Respondents who scored 0-3 points were adjudged to have poor knowledge (Poor knowledge <3 (<50% of correct answers) those with 4-7 points to have high knowledge (Adequate knowledge  $\geq 3$  ( $\geq 50\%$  of correct answers)).

## RESULTS

A total of 715 girls participated in the study of which 421 were from the rural area and 294 from urban area. It was observed that majority of the girls got their first

menstruation related information from their mothers or sisters i.e., 60.6% (314/518) [Figure 1].

Figure 1: Respondents' first source of information on menstruation.

More than half of the girls i.e., 53.7% (384/715) were not even aware of the source of menstrual blood. Lack of awareness was also seen in the rural area i.e., 66.4% (279/384) as well, whereas in the urban area majority of the girls had incorrect knowledge of bladder being the source [Figure 2] of menstrual blood.

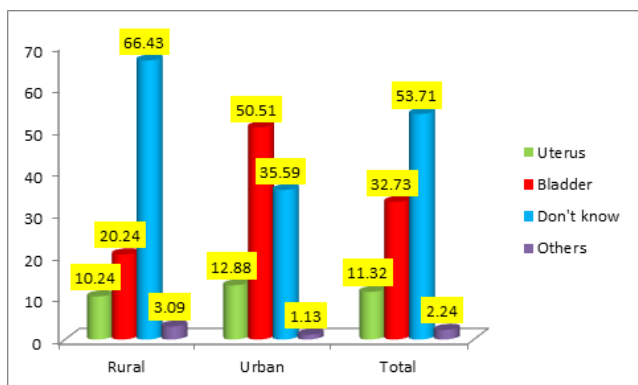


Figure 2: Respondents' perception regarding source of menstruation.

A higher number of girls were normal to their first reaction to menstruation i.e., 45.9% (328/518), similar was the case in urban area as well 59.7% (176/328), whereas in the rural setup maximum girls were embarrassed about it i.e., 37.4% (157/420) [Figure 3].

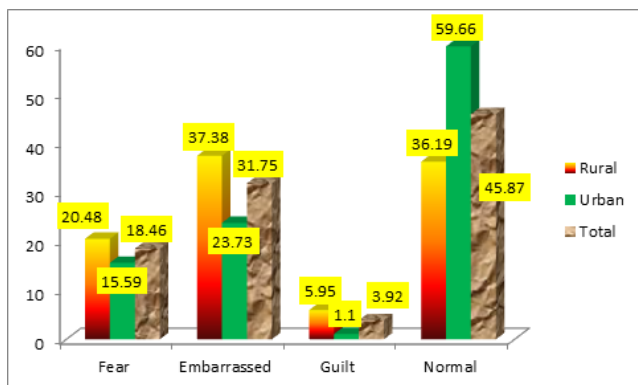


Figure 3: Respondents' reaction to menstruation.

Majority of the urban girls felt that it was a normal hormonal cycle i.e., 33.6% (99/295) [Figure 4].

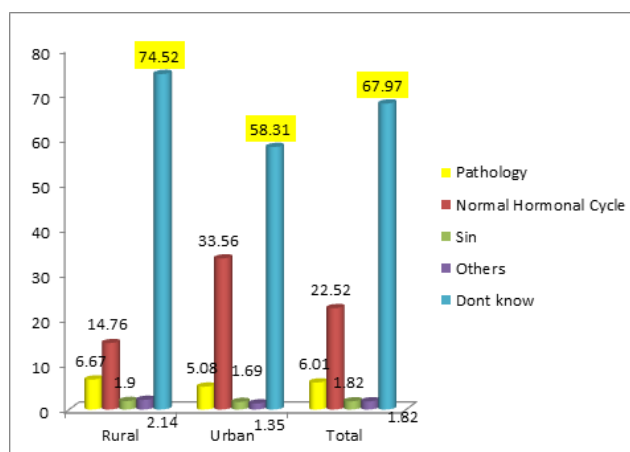


Figure 4: Respondent's Perception regarding menstruation.

Table 1 shows the association of menstrual knowledge outcome score amongst rural and urban girls with socio-demographic factors. The total knowledge score was only 27.6% (197/715). It was more among the urban girls i.e., 43.5% (128/294) as compared to the rural girls i.e., 16.4% (69/421). As far as age group is concerned, it was found to be maximum amongst 16-17 years age group i.e., 34.9% (107/307) as a whole and also in rural girls (25.2%) (36/143) whereas in urban girls it was almost the same in all the age groups. The difference was not found to have a significant association. It was seen that higher the class (11<sup>th</sup>-12<sup>th</sup>) greater is the knowledge. The difference was also found to be statistically significant. Religion and type of family also does not have a significant association with knowledge score.

Socio-demographic Characteristic	Rural		Urban		Total		Chi Square	P-value
	Respondents studied	Respondents with adequate knowledge	Respondents studied	Respondents with adequate knowledge	Respondents studied	Respondents with adequate knowledge		
<b>Age group (years)</b>								
<12	7	-	-	-	7	-	1.58	>0.05
13-15	58	2 (3.45)	11	4 (36.36)	69	6 (8.69)		
16-18	186	28 (15.05)	90	40 (44.44)	276	68 (24.64)		

16-17	143	36 (25.17)	164	71 (43.29)	307	107 (34.85)		
>18	27	3 (11.11)	29	13 (44.83)	56	16 (28.57)		
Total	421	69 (16.39)	294	128 (43.54)	715	197 (27.55)		
<b>Class</b>								
<9th	28	1 (3.57)	2	-	30	1 (3.33)	5.6	<0.05
9-10th	189	18 (9.52)	41	13 (31.71)	230	31 (13.48)		
11-12th	204	50 (24.51)	251	115 (45.82)	455	165 (36.26)		
Total	421	69 (16.39)	294	128 (43.54)	715	197 (27.55)		
<b>Religion</b>								
Hindus	350	47 (13.43)	210	91 (43.33)	560	138 (24.64)	0.19	>0.05
Muslim	65	19 (29.23)	84	37 (44.05)	149	56 (37.58)		
Sikh	3	1 (33.33)	-	-	3	1 (33.33)		
Christian	3	2 (66.67)	-	-	3	2 (66.67)		
Total	421	69 (16.39)	294	128 (43.54)	715	197 (27.55)		
<b>Type of family</b>								
Nuclear	283	44 (15.55)	192	88 (45.83)	475	132 (27.79)	0.5	>0.05
Joint	138	25 (18.12)	102	40 (39.22)	240	65 (27.08)		
Total	421	69 (16.39)	294	128 (43.54)	715	197 (27.55)		

**Table 1:** Menstrual knowledge score in relation to socio-demographic characteristics.

Table 2 shows the association of menstrual knowledge outcome score amongst rural and urban girls with Parental Factors. It was found that literacy of the mothers have a significant association with knowledge of girls. Overall it was found to be 35.5% (151/425). Knowledge score was found to be almost double in urban girls whose mothers were literate i.e., 44.7% (106/237) as compared to their rural counterparts i.e., 23.9% (45/188). The difference was also found to be statistically significant.

Mother's working status was found to have no association with knowledge score. Girls whose father were either businessman or in service had a better knowledge score (45.8%) (54/118) than other girls. Similarly, Urban girls whose father were either business or service class i.e., 50.3% (78/155) had better Knowledge score as compared to rural girls i.e., 34.9% (25/66). The difference was also found to be statistically significant.

Parental Variables	Rural		Urban		Total		Chi Square	P-value
	Respondents studied	Respondents with adequate knowledge	Respondents studied	Respondents with adequate knowledge	Respondents studied	Respondents with adequate knowledge		
<b>Mother's education</b>								
Illiterate	233	24 (10.30)	57	22 (38.60)	290	46 (15.86)	7.75	<0.001
Literate	188	45 (23.94)	237	106 (44.72)	425	151 (35.53)		
Total	421	69 (16.39)	294	128 (43.54)	715	197 (27.55)		
<b>Mother's Occupation</b>								
Housewife	397	67 (16.88)	272	120 (44.12)	669	187 (27.95)	1.05	>0.05
Working	24	2 (8.33)	22	8 (36.36)	46	10 (21.74)		
Total	421	69 (16.39)	294	128 (43.54)	715	197 (27.55)		

Father's Occupation							
Farmer/Labourer	341	44 (12.91)	116	39 (33.62)	457	83 (18.16)	20.7 <0.001
Business/Service	66	23 (34.85)	155	78 (50.32)	221	101 (45.70)	
Unemployed	14	2 (14.29)	23	1 (4.35)	37	3 (8.11)	
Total	421	69	294	128	715	197	

**Table 2:** Menstrual knowledge score in relation to parental factors.

## DISCUSSION

Menstrual hygiene is crucial in reproductive life of every woman. It is remarkable that poor menstrual hygiene contribute extremely to reproductive and urinary tract infections. Therefore, adolescent girls should have sound knowledge on menstrual hygiene and should follow good menstrual hygiene practices.

Assessing the knowledge and imparting the knowledge on menstrual hygiene to adolescent girls is one of the essential steps to create the awareness among them [12]. Poor hygiene during menstruation has been associated with serious ill-health ranging from reproductive tract infection to urinary tract infection [11]. Females are generally expected to exercise good hygienic practices during menstruation to prevent themselves from these problems. However, remaining stable during menstruation requires that females especially the adolescents are prepared psychologically to develop the associated power and mastery over the physiological changes that occur during this period. They should have sufficient knowledge about menstruation, menstrual cycle and of menstrual hygiene even before they attain menarche [9].

It is desirable that each and every girl child should be aware about menstruation, which is an important event that occurs at the threshold of adolescence and ideally before the attainment of menarche [12]. This fact completely goes in line with our study findings as majority (72%) of the girls in our study had first heard of menstruation and acquired knowledge related to it before attaining menarche. Urban girls were more aware (86.8%) as compared to their rural counterparts (62%). Awareness in our study was higher as compared to other studies, a study by Paria et al., Dhingra et al., Adhikari et al., Gupta et al. [13-16]. The high level of knowledge in our study may be related to the diverse socio-cultural background of the respondents and the cosmopolitan nature of the study area in contrast to other studies that had homogenous backgrounds and were mainly rural settings.

Menarche is an important event in girls at the threshold of adolescence. Before menarche, the girls should be educated about the facts of menstruation, physiological implications, about the significance of

menstruation and who else could do it best than their mothers. Mothers should therefore play an active role for discussing all aspects of menstrual matters with their daughters without any hesitation before their attainment of menarche. Teachers can be great motivators too who may take classes on menarche, menstrual hygiene, RTI/STI under the routine school curriculum. Our study findings are completely in line with the following fact as about two-third of our respondents got information related to menstruation from their parents or sisters (60%). This will play a long way in maintaining a healthy reproductive tract for each and every girl child who, after she becomes a mother, shall percolate the healthy message to her female offspring. The fewer gaps in this study may be attributed to the good literacy status of the mothers and small inhibitions for the mothers in talking to their daughters regarding the significance, hygienic practices and a healthy attitude towards menstruation. A friendly relationship and better communication between mother and daughter may be one of the reasons for the present finding. In majority of studies, mothers were the primary informant [7,13,17] whereas in some studies, girls either got information from friends or other sources like various sources of media etc. [9,18]. The difference between our study findings and those of the other studies may be due to cultural differences since some cultures encourage parents to discuss freely with their children on their cognitive development. Relatively very few friends in this group appeared to have an open discussion with their peers about these aspects of life however only some girls learnt about the topic from social media and school teachers. It may be concluded that reproductive health is considered as a taboo and hence this topic is never discussed openly in the class or even talked about among the peer group. A study in wardha district of India reported that only 11% of the girls received information from their teacher, and hence menstrual hygiene is not treated as a topic in health related subjects [19]. It was very sad to observe in the present study that most of the girls did not know about the source of menstrual bleeding. Only 11.3% of the study girls stated that menstrual bleeding came from the uterus, 53.7% were unaware of the source and rest of them had the wrong information that it was from the bladder (32.7%). In rural areas, most of the girls had lack of knowledge whereas in the urban area, misconception i.e., bladder was thought to be the source of bleeding.



Our study findings corroborates with other studies [11,12]. The above observation might be attributed to absence of proper health education programmes in schools focusing on menstrual hygiene. This is due to the fact that all integrated science and biology text books being used for all levels of the selected schools irrespective of ownership (Federal Government, State or Private) had no topic on menstruation [20]. Knowledge obtained from formal settings as schools will go a long way in providing better information to the growing adolescent girls, as information given by mothers; friends and other relatives may be incomplete or incorrect. Our study showed different results from those reported by Thakre et al. where despite the lack of any curriculum in our schools on reproductive health issues, girls had good knowledge about the origin of the menstrual blood [7]. Further, the above findings also highlight the fact that there is low level of knowledge among girls about female anatomy. Also the topic is least discussed by girls as they feel uncomfortable and shy. In our study, majority of the girls had no idea about the cause of menstruation (67.9%) and overall 22.5% felt that the menstrual cycle has an important physiological role of which 33.5% were from urban area and only 14% was from rural area. In the urban area, majority (60%) felt normal about it as compared to rural girls who felt embarrassed (37.4%) about it. Anonymous findings were reported by Thakre et al., and Adhikari et al. [7,15]. In regards to the reaction to the first menstruation, majority of the girls felt normal about it (45.9%) of which maximum were from urban area (59%), one third of the girls were embarrassed about it and the remaining felt fear, anxiety and guilt. The reason for fear and anxiety might not only be due to lack of prior knowledge regarding menstruation but may also be attributed to the inadequate or wrong information due to lack of classroom teaching on the same. This study lays in comparison with Tang et al, and Farhana et al. in which participant's emotional reaction to menarche were largely negative, with majority being annoyed and embarrassed, fear and anxious [21,22]. In our study only 14% of the females had correct knowledge that menstruation has no relation with changes in weight, which is in contrast, to a study by Abeer Eswi et al., who reported that it is usually associated with weight gain (22.5%). In our study, Overall 27.6% girls had adequate knowledge regarding menstruation as assessed by scores [23]. Majority (43.5%) were from urban area and only 16.4% were from rural area. Levels of adequate knowledge were found to be lower in our study as compared to a study by Shanbag et al. where 64.6% girls answered 50% of the knowledge questions correctly [24]. The reason for this could be, even though there has been a positive influence of urbanization, there is still a gap in the knowledge and a further scope for improvement in the adolescent reproductive health coverage in the study area. It was seen that the level of adequate knowledge was significantly higher among girls who were educated above High school and were having literate mothers and

working fathers. Our study findings are consistent with Shanbag et al. where a significantly higher number of girls with positive attitude were found in the older age group [24]. There was no significant association between type of family and knowledge of menstruation in this study which is similar to findings of Anusree et al. and Arunmozhi et al. [10,25-28].

## LIMITATIONS

Study findings are based on perceptions of the study participants and may also be associated with recall biases.

## CONCLUSION

It can be concluded that the overall menstrual knowledge in both the areas, was found to be poor and the various beliefs were found to be inappropriate. Also it was found to be comparatively lesser in rural area. Accurate education of the adolescent girl on menstruation is important because many misconceptions exist in the adolescent population about menstruation, some perceive it as a bad or strange thing; others think of it as frightening or an embarrassing experience. In view of the vital role of the mothers, it is very important that the mothers should be armed with correct and appropriate information on reproductive health, so that she can give this knowledge to her growing girl child. It is also essential for the teachers, who may not have the necessary skills to impart reproductive health education, including menstrual hygiene to their students. They have to be given requisite skills-usually through training or workshops. This approach to menstrual education will eliminate some misconceptions about menstruation and ensure that certain unfounded believes are not passed on from generation to generation.

## ACKNOWLEDGMENTS

The study was supported by SRMSIMS, Bareilly. Authors are grateful to Chairman, Director, Dean, MS and HOD for their consent and encouragement during the entire period of study. Authors also wish to thank the Principal, teachers and students of the school for their consent and cooperation during the study.

## REFERENCES

1. Pandit D, Bhattacharyya PK, Bhattacharya R. Menstrual hygiene: Knowledge and practice among adolescent school girls in rural areas of West Bengal. *Clin Exp Dent Res* 2014;13:19-24.
2. Sapkota D, Sharma D, Budhathoki SS, Khanal VK, Pokharel HP. Knowledge and practices regarding menstruation among school going adolescents of rural Nepal. *J Kath Med Col* 2013;2:1-5.
3. Ahuja A, Tiwari S. Awareness about pubertal changes among adolescent girls. *J Fam Wel* 1995;41:46-50.
4. Chaudhari RH. Socio-economic demographic and reproductive health profile of adolescents in the SAARC countries. Paper

- presented in south Asia Conference on Adolescents; New Delhi, India, 1998.
5. Khanna A, Goyal RS, Bhawsar R. Menstrual practices and reproductive problems: A study of adolescent girls in Rajasthan. *J Health Man* 2005;7:91-7.
  6. Mudey AB, Keshwani N, Mudey GA, Goyal RC. A cross-sectional study on the awareness regarding safe and hygienic practices amongst school going adolescent girls in the rural areas of Wardha district. *Glo J Health Sci* 2010; 2:225-31.
  7. Thakre S, Thakre SS, Reddy M, Rathi N, Pathak K, Ughade S. Menstrual hygiene: Knowledge and practice among adolescent school girls of saoner, Nagpur District. 2011;5:1027-33.
  8. Rumun AJ, Ssuega AP. Menstrual knowledge and practices among adolescent females in makurdi metropolis. 2014;3:113-21
  9. Lawan UM, Yusuf NW, Musa AB. Menstruation and menstrual hygiene amongst adolescent school girls in Kano, North-western Nigeria. *African Journal of Reproductive Health*, Sept. 2010;14:201-208.
  10. Anusree PC, Roy A, Sara AB, Faseela VCM, Babu GP, Tamrakar A. Knowledge regarding menstrual hygiene among adolescent girls in selected school, Mangalore with a view to develop an information booklet. *J Nur Health Sci* 2014;3:55-60
  11. Dasgupta A, Sarkar M. Menstrual hygiene: How hygienic is the adolescent girl? *Indian j. Comm. Med* 2008;33:77-80.
  12. Ray S, Dasgupta A. Determinants of menstrual hygiene among adolescent girls: a multivariate analysis. *Nat J Comm Med* 2012;3:294-301.
  13. Paria B, Bhattacharyya A, Das S. A comparative study on menstrual hygiene among urban and rural adolescent girls of West Bengal. *Family Med Prim Care* 2014; 3:413-417
  14. Dhingra R, Kumar A, Kour M. Knowledge and practices related to menstruation among tribal (Gujjar) adolescent girls. *Ethno-Med*. 2009;3:43-48.
  15. Adhikari P, Kadel B, Dhungel SI, Mandal A. Knowledge and practice regarding menstrual hygiene in rural adolescent girls of Nepal. *Kathmandu Univ Med J* 2007;5:382-6.
  16. Gupta J, Gupta H. Adolescence and menstruation. *J Family Welfare* 2001;47:1-13.
  17. Nair P, Grover VL, Kannan A. Awareness and practices of menstruation and pubertal changes amongst unmarried female adolescents in a rural area of East Delhi. *Indian J Community Med* 2007;32:156-7.
  18. El-Gilany AH, Badawi K. Menstrual hygiene among adolescent schoolgirls in Mansoura, Egypt. *Reprod Health Matters* 2005;13:147-52.
  19. Mudey AB, kesharwani N, Mudey GA, Goyal RC. A cross-sectional study on awareness regarding safe and hygienic practices amongst school going adolescent girls in rural area of Warha District, India *Glo J Hlth* 2010;2: 225-31.
  20. Oche MO, Umar AS, Gana GJ, Ango JT. Menstrual health: The unmet needs of adolescent girls' in Sokoto, Nigeria. *Sci Res Ess* 2012;7:410-18.
  21. Tang, Tang CS, Yeung DY, Lee AM. Psychological correlates of emotional responses to menarche among Chinese adolescent girls. *J Adolesc Health* 2003;33:193-201.
  22. Farhana A, Nishat Z, Gulfaeen H, Shazia R, Ambreen A, Aftab A. Attitudes towards menstruation among young women. *Pak J Med Sci* 2010;26:619- 22.
  23. Eswi A, Helal H, Elarousy W. Menstrual attitude and knowledge among egyptian female adolescents. *J Amer Sci* 2012;8:555-65
  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. *Inter J Coll Res Int Med Pub Hlth* 2012;4:1353-62.
  25. Arunmozhi R, Anitharam P. A cross sectional study to assess the levels of knowledge practices of menstrual hygiene among adolescent girls in Chennai. *E J Med* 2013;3:211-17
  26. Lawan UM, Yusuf NW, Musa AB. Menstruation and menstrual hygiene amongst adolescent school girls in Kano, Northwestern Nigeria. *Afr J Reprod Hlth* 2010;14:201-7.
  27. Anju A, Patil R. Menstrual hygiene and practices of rural adolescent girls of Raichur. *Int J Biol Med Res* 2013;4:3014-17
  28. El-Gilany AH, Badawi K, El-Fedawy S. Menstrual hygiene among adolescent school girls in Mansoura, Egypt. *Reprod Health Matters* 2005;13:147-52.