

Menstrual Health and Hygiene Practices among the Rural and Urban Adolescents of West Bengal, India

Das S, Thakur J and Goswami M*

Department of Anthropology, University of Calcutta, India

***Corresponding author:** Monali Goswami, Department of Anthropology, University of Calcutta, 35, Ballygunge Circular Road Kolkata 19, India, Tel: 8697948609; Email: goswami_monali@rediffmail.com

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Abstract

The present study is an endeavor to focus on the menstrual health and hygiene practices among the rural and urban adolescent girls of West Bengal. A total number of 190 adolescent girls (Rural-75; Urban-115) aged 11 to 19 years were apparently selected to participate in the study. Rural and urban adolescent girls differed significantly ($p \leq 0.05$) with respect to mean cycle length, nature of discharge, change of absorbent and premenstrual symptoms. Some menstrual hygiene indices like absorbent used, bath type and frequency, cleaning of external genital (materials used and frequency), change of pads in school and place of its disposal have shown a significant difference between the rural and urban girls. Thus, menstrual health and hygiene practices differ significantly between the rural and urban adolescents. Various factors resolute the menstrual characteristics and behaviors of the rural and urban adolescent girls. However, awareness regarding healthy menstrual practices is indispensable. Therefore, comprehensive education programme should be augmented on menstrual health and hygiene practices

Keywords: Menstrual Health; Adolescent Girls; Hygiene Practices; Rural-Urban Difference; West Bengal

Introduction

Adolescence is the transitional phase of physical and mental development between childhood and adulthood and is characterised by immense hormonal changes [1]. The most striking changes in the adolescent girls are the onset of menarche. Menarche marks the beginning of menstrual cycle in a girl. The menstrual cycle is a very important indicator of women's reproductive health and of their endocrine function. Menstrual health is one of the major areas of concern in reproductive health, and affects a large number of women throughout their reproductive

life from adolescence. Moreover, menstrual disorders and improper hygienic care have direct consequences in fertility and reproductive tract infections, respectively [2].

Menstrual health is affected by ethnicity, socioeconomic and environmental factors. Research shows that age at menarche is delayed in rural areas than the urban counterpart. A study conducted by Mpora, et al. [3] among secondary school girls in post-conflict northern Uganda found that the mean age at menarche was 13.6 ± 1.3 for rural and $13.3 \pm$ for urban dwelling girls. Dambhare, et al. [4] carried out a study among adolescent

girls in Central India, and found that the mean ages of menarche were 13.51 ± 1.04 years and 13.67 ± 0.8 years for urban and rural areas, respectively. Ray, et al. [5] in their study among the rural and urban adolescents of West Bengal found place of residence as a significant predictor of age at menarche. Menstrual pattern varies from population to population. In a study by Kanotra, et al. [6] among rural adolescent girls of Maharashtra found that majority of the girls had intermenstrual interval of 28-35 days with a mean duration of menstrual flow of 4.28 ± 1.06 days.

Menstrual disorders such as dysmenorrhea, premenstrual syndrome, irregular menses, excessive bleeding during menstruation etc are common in adolescence because they are closely related to the processes involved in the pubertal development of females [7-9]. One community based cross sectional study by Patil, et al. [10] among the adolescent girls of the rural areas of the Ratnagiri district of Rajasthan, India, reported that as far as problems related to menstruation cycle were concerned Dysmenorrhea was the commonest problems faced by adolescent girls. Srivastava, et al. [11] carried out a cross-sectional descriptive study on school going adolescent girls from rural and urban areas of Chattisgarh and found that 59% of urban girls and 64.5% of rural girls reported menstrual problems. Higher percentage of rural girls experienced psychological symptoms like depression, anxiety, fatigue, food cravings and headaches, as compared to urban girls.

Hygiene practices related to menstruation, like choice of the absorbents, prolonged use of these absorbents, inappropriate laundering of the cloth absorbent and improper perineum care, create an environment for harboring harmful microorganisms that may affect the urinary tract and also infect the perineum, which in turn can affect the reproductive health of woman. Good hygiene, such as use of sanitary pads and adequate washing of the genital area, is essential during menstruation. Menstrual hygiene and management is an issue that is insufficiently acknowledged and has not received adequate attention. Some of the studies from India show that, generally, the urban poor and the rural people use a piece of old cloth as an absorbent at the time of menstrual discharge, and that the urban girls are more aware about menstrual hygienic practices than the rural girls. [2] In another study, Paria, et al. [12] reported that majority of the urban girls were using commercial sanitary pads on the other hand use of homemade

sanitary pad was more prevalent among the rural girls. The study also showed that the hygienic practices were more satisfactory in the urban area as compared to rural ones. The present study is an endeavor to focus on the menstrual health and hygiene practices of the rural and urban adolescent girls of West Bengal, India.

Materials and Methods

The present study was an observational cross sectional study. The participants constituted of adolescent girls belonging to two Government schools from Panskura II block of Mecheda under Purba Medinipur district (rural) and two Government schools from Behala under South 24 Paraganas (urban) of West Bengal. A total number of 190 adolescent girls (Rural-75; Urban-115) aged 11 to 19 years were apparently selected to participate in the study using a purposive random sampling method. Inclusion criteria of selection of the study participants were unmarried adolescent girls, and who have attained menarche at least one year prior to the date of interview and the exclusion criteria included those with serious reproductive or other health problems. Prior to data collection a written approval was obtained from the school authorities. The nature of the study was described to the participants before the interview and a written consent was taken.

Interview schedule included relevant information like age, socio-economic status included education and occupation and data on menstrual health like cycle length, duration of menstrual bleeding, nature of discharge and hygiene practices.

The analyses of the data were done using the Statistical Package for Social Sciences version 18.0. Descriptive statistics were used for calculating the frequency, percentage and mean of the variables. Bivariate analysis (chi square, Fisher exact test and t test) were done for comparative study. Significant values of $p < 0.05$, $p < 0.01$ and $p < 0.001$ have been considered as the significant levels.

Results

Table 1 shows the mean ages of the participants were 14.17 ± 1.39 years and 14.44 ± 1.51 years for rural and urban, respectively. Their mean completed years of education were 9.32 ± 1.254 years and 9.37 ± 1.013 years

	Rural (N=75)		Urban (N= 115)	
	Frequency	%	Frequency	%
Age in years				
13-Nov	25	33.3	26	22.6
14-16	44	58.7	79	68.7
17-19	6	8	10	8.7
Mean age of the participants (years)	14.17 ± 1.39		14.44 ± 1.51	
Participant's level of education				
Up to upper primary level	18	24	22	19.1
Up to secondary level	45	60	82	71.3
Higher secondary level	12	16	11	9.6
Mean of completed years of education	9.32 ± 1.254		9.37 ± 1.013	
Mother's level of education[¶]				
Non-literate	8	10.67	2	2.17
Up to primary level	1	1.33	17	18.48
Up to secondary level	22	29.33	57	61.96
Up to higher secondary education	20	26.67	15	16.3
Above higher secondary education	24	32	1	1.09
Mean of completed years of education	4.72 ± 1.67		3.97 ± 0.77	
Father's level of education[†]				
Non-literate	5	7.25	0	-
Up to primary level	3	4.35	14	15.91
Up to secondary level	19	27.54	59	67.05
Up to higher secondary education	6	8.7	9	10.23
Above higher secondary education	36	52.17	6	6.82
Mean of completed years of education	5.09 ± 1.68		4.08 ± 0.73	
Mother's occupation[‡]				
Homemakers	69	92	93	81.58
Unskilled worker	0	-	1	0.88
Skilled worker	0	-	2	1.75
Government service	4	5.33	1	0.88
Private service	0	-	1	0.88
Business	2	2.67	4	3.51
Others [£]	0	-	12	10.53
Father's occupation[^]				
Unskilled worker	5	6.85	0	-
Skilled worker	6	8.22	30	27.03
Government service	24	32.88	4	3.6
Private service	11	15.07	14	12.61
Business	24	32.88	42	37.84
Others [¶]	3	4.11	21	18.92

Table 1: Socio-demographic characteristics of participants.

¶:23 participants in urban area were unable to respond to their mother's education

†: 6 participants in rural and 27 participants in urban area were unable to respond to their father's education

‡:1 participant in urban area was unable to respond to their mother's occupation

^:2 participants in rural and 4 participants in urban area were unable to respond to their father's occupation

£: other occupations like maid and babysitter.

¶: other occupations like farmer, priest, painter, hawker, security, etc.

Majority of the mothers (32.0%) had attained education above higher secondary level in rural areas while in urban areas most of the mothers (61.96%) completed secondary level of education. The data related to fathers' education also depicts the same picture.

In terms of occupation, most of the mothers were homemakers in both areas while in case of fathers, most of them were associated with business in both rural and urban areas.

Table 2 highlights that the mean age at menarche was 11.53 ± 1.288 years in rural which is lower than 11.65 ± 1.271 years for urban. The same trend is found for both mean menstrual years and mean duration of menstrual discharge. In contrast, in case of mean number of peak discharge days, the value is more i.e. 1.93 ± 0.622 day for rural than 1.82 ± 0.756 day for urban. No significant differences have been found between the mean values of the above mentioned variables in rural and urban areas.

	Rural (N=75)		Urban (N=115)		p value
	Frequency	%	Frequency	%	
Age at menarche					
≤ 11 years	39	52	50	43.5	£ 0.81
12 years	20	26.7	38	33	
13 years	11	14.7	20	17.4	
14 years	4	5.3	5	4.3	
≥ 15 years	1	1.3	2	1.7	
Mean age at menarche (years)	11.53 ± 1.288		11.65 ± 1.271		€ 0.53
Mean Menstrual years	2.64 ± 1.074		2.79 ± 1.501		€ 0.45
Cycle length					
≤ 20 days	2	2.7	2	1.6	£ 0.15
21 - 35 days	68	93.2	111	97.4	
≥ 36 days	5	4.1	2	0.9	
Mean cycle length	30.44±5.28		29.13±3.88		€0.051*
Duration of menstrual bleeding					
3-4 days	11	14.7	20	17.4	¥ 0.11
5-6 days	46	61.3	53	46.1	
≥ 7 days	18	24	42	36.5	
Mean duration of menstrual discharge (days)	5.59±1.220		5.70±1.352		€ 0.57
Mean number of days of peak discharge	1.93±0.622		1.82±0.756		€ 0.27
Nature of Discharge					
With blood clot	64	85.33	74	64.35	0.002**
Without blood clot	11	14.67	41	35.65	
Changes of absorbent on peak day					
One time	0	-	3	2.61	£ 0.01**
2-3 times	41	54.67	80	69.57	
4-5 times	34	45.33	30	26.09	
≥ 6 times	0	-	2	1.74	
Number of absorbent used during last menstruation					
1-6	4	5.3	9	7.8	¥0.505
≥ 7	71	94.7	106	92.2	

Table 2: Distribution of the menstrual profile of the participants.

¥Chi-square test was performed

£Fisher's exact test was performed

€t test was performed

*p< 0.05; **p< 0.01

Majority of the participants, 52.0 % from rural and 43.5 % from urban had achieved menarche within 11

years of age while only few, 1.3% from rural and 1.7% from urban started menstruating from 15 years of age.

The mean cycle length was found to be slightly higher in rural than that of urban. The longer cycle length of greater than or equal to 36 days is observed mostly (4.1%) for rural than for urban (0.9%). Significant difference was found between mean cycle length and place of residence ($p < 0.05$).

Duration of menstrual discharge was found to be 5-6 days in most of the participants from both areas. Majority of the participants from both categories changed the absorbents 2-3 times on peak discharge day. Significant association was found between change of absorbents on peak day and place of residence ($p < 0.01$).

A higher percentage of the participants, 85.33% of rural and 64.35% of urban, had menstrual discharge in the form of fluid and clot. Significant association had been found between nature of menstrual discharge with that of place of residence ($p < 0.01$).

Table 3 reveals that majority of the participants had regular menstrual cycle. Irregularity in menstrual cycle found more among urban (18.3%) compared to rural (12.0%). Similarly, skipping of periods in last one year was more (30.4%) among urban women's than rural (21.3%). No significant association was found with respect to regularity of menstrual cycle and place of residence.

	Rural(N=75)		Urban(N=115)		p value
	No.	%	No.	%	
Regular	66	88.0	94	81.7	0.25
Irregular	9	12.0	21	18.3	
Skipping of periods in last one year					
Skipped	16	21.3	35	30.4	0.166
Not skipped	59	78.7	80	69.6	
Presence of Pre Menstrual Syndromes					
Yes	45	60	91	79.1	0.004**
No	30	40	24	20.9	
Presence of Dysmenorrhea					
Yes	67	89.33	105	91.3	0.84
No	8	10.67	10	8.7	

Table 3: Regularity of menstrual cycle and menstrual disorders.

* $p < 0.05$; ** $p < 0.01$

Premenstrual syndromes was encountered by majority of the participants, 60.0% of rural and 79.1% of urban and a significant association was found ($p < 0.01$). Prevalence of dysmenorrhea was common in both rural (89.33%) and urban (91.30%) categories. But

no significant association was found with place of residence.

Table 4 depicts that among the participants from rural area, pain in lower abdomen (77.78%) followed by irritability (35.56%) were the most common PMS.

Premenstrual syndrome	Total			
	Rural (N=45)		Urban (N=91)	
	No.	%	No.	%
Irritability	16	35.56	39	42.9
Mood swings	9	20	20	22
Headache	7	15.56	18	19.8
Fatigue	10	22.22	32	35.2
Lower backache	9	20	45	49.5
Pain in lower abdomen	35	77.78	70	76.9
Pain in lower extremities	9	20	29	31.9

Table 4: Distribution of participants for reported symptoms of Pre Menstrual Syndrome.

In urban area, major percentages of occurrence of PMS was observed with regards to pain in lower abdomen (76.92%), lower backache (49.45%), irritability (42.86%), fatigue (35.16%) and pain in lower extremities (31.87%).

Table 5 highlights various dysmenorrheal problems encountered by the participants in rural and urban area.

In the rural area, the most common problem encountered was pain in lower abdomen (89.55%), followed by mood change (49.25%) and tiredness (38.81%) among those who reported for dysmenorrhea during the last three cycles of menstrual discharge.

Symptoms Rural (N=67)	Total No. of person suffering dysmenorrheal problem			
	Rural		Urban	
	No.	%	No.	%
Pain in lower abdomen	60	89.55	97	92.4
Lower back pain	16	23.88	34	32.4
Headache	15	22.39	17	16.2
loss of appetite	13	19.4	16	15.2
Tiredness	26	38.81	43	41
mood change	33	49.25	30	28.6
Depression	11	16.42	31	29.5

Table 5: Prevalence of Dysmenorrhoea.

In case of participants from urban areas, 92.38% of the participants who reported for dysmenorrhea suffered from pain in lower abdomen followed by tiredness (40.95%) and lower back pain (32.38%).

Table 6 shows that the type of protective material used in both the areas mostly was sanitary pads. Significant association was found in this case with the type of protective material and the areas ($p < 0.01$).

	Rural (N=75)		Urban (N=115)		p-value
	No.	%	No.	%	
Materials used during menstruation					
Sanitary pad	65	86.7	112	97.4	0.001***
Old washed cloth	3	4	0	-	
Pad and old washed cloth	6	8	0	-	
Pad and new cloth	1	1.33	3	2.6	
Number of times bath in a day					
1 time	63	84	82	71.3	£0.04*
2 times	12	16	33	28.7	
Bath type					
Only normal water	18	24.0	3	2.6	£0.001***
Soap and normal water	53	70.7	112	97.4	
Soap and lukewarm water	4	5.3	-	0.0	
Hand washing					
Regular	75	100.0	115	100	-
Irregular	0	-	0	-	
Hand washing with					
Water	3	4.0	5	4.3	£1.00
Soap and water	72	96.0	110	95.7	
Cleaning of external genitalia					
Yes	75	100.0	115	100.0	-
No	0	-	0	-	

Frequency of cleaning of external genitalia					
Once daily	12	16.0	8	7.0	¥0.002**
Twice daily	15	20	8	7.0	
More	48	64.0	99	86.1	
Material used for cleaning external genitalia					
Only lukewarm water	1	1.33	0	-	£0.001**
Only normal water	51	68	44	38.3	
Soap and normal water	18	24	62	53.9	
Soap and lukewarm water	3	4	5	4.35	
With antiseptics	2	2.67	4	3.48	
Place of disposal of sanitary pads [↓]					
Dustbin	67	89.3	115	100.0	£0.008**
Pond	1	1.3	-	-	
River	1	1.3	-	-	
Space near pond	3	4	-	-	
Washing of re-used cloth with [†]					
Normal water	1	11.1	0	-	-
With Antiseptic	0	-	0	-	
Only Luke warm water	0	-	0	-	
Soap & normal water	6	66.7	0	-	
Soap & Luke warm water	2	22.2	0	-	
Places of drying used cloth [†]					
Outside in sunlight	9	100.0	0	-	-
Inside house	0	-	0	-	
Outside house without sunlight	0	-	0	-	
Change of pads in school [↓]					
Yes	16	21.3	57	49.6	£0.001***
No	59	78.7	58	50.4	

Table 6: Distribution of the participants according to their menstrual hygiene practice.

↓: 3 participants used only cloth

†: only 9 participants in rural area used old washed cloth

¥Chi-square test was performed

£Fisher's exact test was performed

*p< 0.05; **p< 0.01; ***p< 0.001

With regards to menstrual hygiene practices, most of them are aware of it. All the participants had regular bath during menstruation in both areas and a major percentage of them (70.7% for rural and 97.4% for urban) uses soap during bath.

Regular washing of hands was observed 100% in both areas with majority of them using soap for washing hands.

Cleaning of external genitalia was done by all the participants where majority of them, 64.0% of rural and 86.1% of urban cleaned the external genitalia more than twice a day during menstruation. 68.0% participants from rural used only normal water followed by 24.0% who used soap and normal water while it was just the opposite

in case of urban where majority of them used soap and normal water (53.9%) followed by 38.3% who used only normal water.

The place of disposal of sanitary pads was dustbin for all the participants from urban area while the same was for majority of the participants from rural area but very few percentage of them disposed off the used pads near ponds and river.

Among the rural participants who used cloth as the protective material during menstruation, 66.7% of them washed the cloth with soap and normal water followed by 22.2% of them who washed the same with soap and lukewarm water. All the participants who used cloth dried

them outside in sunlight. Majority of the participants from both areas changed pads during school hours. Significant association was found in almost all the cases.

Discussion

Onset of menarche is the most striking change that takes place in adolescent girls. Though serious gynecological pathology is rare in this age group, but menstrual disturbances are not uncommon. Proper attention is least paid to these menstrual irregularities and problems by the girls and their family which may add further disruption to this difficult phase.

In a country like India, the problems of non-literacy, improper health education, gender disparity, 'culture of silence' and lack of governmental initiative to address this group have resulted in poor reproductive health condition of adolescent females [13].

Various studies show that onset of menarche among rural girls is significantly delayed as compared to urban girls [5,14-16], i.e. place of residence plays a proactive role on the age at menarche of the adolescent girls. However, unlike previous studies, in the present study the mean age at menarche is lower in the rural areas than their urban counterparts. This may be because of proper nutrition provided to the girls during the pre-pubertal years. However, no significant association had been found between age at menarche and place of residence.

The mean duration of menstrual discharge for rural girls was 5.59 ± 1.220 while those for urban girls were 5.70 ± 1.352 . The mean duration is slightly higher than that of found by the study of Ray, et al. [5], Kanotra, et al. [6] and Valvaikar and Shah [17]. The mean cycle length is consistent with the findings of Kanotra, et al. [6] and Sangwan and Vashisht [18].

Regularity of menstrual cycles was more than eighty percent in both the areas. The occurrences of irregular cycles are common in adolescents in early years since the initial cycles are anovulatory. The findings contradict the findings of Ray, et al. [5] where irregularity was observed in more than eighty percent of rural-urban girls in west Bengal. But present findings are consistent with those of Kulkarni and Durge [19], Kanotra, et al. [6] and Patil and Angadi [20]. Skipping of cycles were relatively low in both the areas.

The nature of menstrual discharge in the form of fluid and clot was recorded by many. Significant difference ($p < 0.01$)

was found between nature of menstrual discharge with that of place of residence. This may be probably due to the difference in the socio-demographic profile, nutritional intake and health care between the rural and urban participants. Majority of the participants had blood clot on day two followed by day one.

Premenstrual syndromes (PMS) and dysmenorrhea are the two most common problems that seem to haunt a wide section of the girls. This is true for the findings of this study too where more than fifty percent of the girls face these problems. PMS differed significantly ($p < 0.01$) among the rural and urban adolescent girls. Similar findings of PMS was reported by Sharma, et al. [21] where 67% of girls, and Sarkar, et al. [22] where 61.5% of girls are experiencing premenstrual problems. Similar occurrence of dysmenorrhea in majority of the participants was observed by Agarwal and Agarwal [23] and George, et al. [24]. PMS and dysmenorrhea was reported by more than half of the participants by Konapur and Nagaraj [25].

The findings of this study highlights that 86.7% of rural girls and 97.4% of urban girls used commercial sanitary pads and rest others used either old washed cloth or a combination of pad and cloth. It is usually seen that easy availability and low cost of using a piece of cloth in contrast to comparatively high cost and low availability of sanitary napkin in the rural area and most of all feeling embarrassed in purchasing sanitary napkins leads to the less use of it with regards to cloth. Though above 85% of the girls in both the areas are using sanitary napkins but in many instances they prefer using cloth irrespective of the awareness and knowledge about hygienic practice of using a sanitary pad. The present study is in accordance with the findings of Omidvar and Begum [26], Sowmya, et al. [27] and Kandpal, et al. [28] where more than half of the adolescent girls used sanitary pads. But studies conducted by Khanna, et al. [29], Dasgupta and Sarkar [30], Raina and Balodi [31] and Wasnik, et al. [32] showed that majority of the adolescent girls preferred the use of cloth during menstruation. Proper disposal of the absorbents in dustbin was practiced by majority of the participants from both areas in the present study. The reused cloth was washed with soap and water by majority of them and all those who used cloth, dried the same outside in sunlight. The findings of Kandpal, et al. [28] also reveals that 73.68% of the participants who used cloth dried them outside in sunlight. Similar findings were reported by Raina and Balodi [31], Sowmya, et al. [27] and Gupta, et al. [33].

Changing of pads at an interval of 3-4 hours is considered as a healthy behaviour for comfort and to prevent odor, regardless of the extent of staining. Changing of pads in school hours was not practiced by most of the participants though the percentage of those who changed pads in school was high in the studied urban schools than those of the rural areas. Similar results were reported by Omidwar and Begum [26] and Thakre, et al. [34] where less than fifty percent of the girls changed pads during school hours. Water facilities in school toilets were present in all the schools where the present study was undertaken.

The participants took daily bath and cleaned their external genitalia daily during menstruation and instead of going to pond, river or any other places, except of few, majority of the girls used piped water for this purpose. Majority of the participants (64.0% from rural and 86.1% from urban) reported of cleaning their external genitalia >2 times per day. This is quite different from the findings of Gupta, et al. [33] where a significant percentage of participants from both rural and urban areas didn't clean their external genitalia daily. Similar studies done by Mudey, et al. [35] and Omidwar and Begum [26] reported of satisfactory cleaning of the external genitalia practiced by only less than half of the total participants.

Conclusion

Menstrual health i.e. the fundamental to women's sexual and reproductive health has been of primary concern by many researchers. The present study, conducted in rural-urban areas, was an endeavor to understand the menstrual health of the adolescent girls who are the future mothers in subsequent few years. Although the Government of India has included Adolescent Health as a component of Reproductive and Child Health Programme II, but still adolescent girls face insurmountable menstrual problems due to lack of care towards their health. The findings showed that distinguishingly girls in rural area have attained menarche earlier than their urban counterparts. Prevalence of menstrual disorders like dysmenorrhea was common in both the areas. In contrast, medical consultation for the menstrual problems is very low. Hygiene practices of almost all the rural-urban girls were satisfactory.

The results of the present study should be viewed under certain limitations. The results would have been more fruitful if the sample size was larger. More data on

socioeconomic variables would have been helpful in finding association between socioeconomic variables and menstrual characteristics.

Nevertheless, the findings of the present study are helpful for carrying out further research works. Awareness about lifestyle modification for a healthy menstrual health and getting rid of the ignorance given to this issue by the adolescents and their families might lead to a healthy pattern of reproductive health. The need for proper knowledge, guidance and counseling is unmet. Targeting adolescent girls, this study provides an indication to implement menstrual health education as well as education on hygiene practice in the school's curriculum that may assist many of the girls in early detection of menstrual related problems. Also healthcare providers should have play an immense importance for these adolescent girls who are going through pubertal transition and to discuss reproductive health issues with mothers and their daughters, to make an early diagnosis, and to choose an appropriate treatment, thus minimizing the negative outcomes caused by various menstrual disorders. Therefore, further studies are required to identify the prevalence of menstruation related problems that would help the policy makers to build better policy and programming on these critical issues for the future mothers.

References

1. Pramanik P, Dhar A (2014) Impact of fast foods on menstrual health of school going adolescent girls in West Bengal, Eastern India. *Global Journal of Biology, agriculture & Health Sciences* 3(1): 61-66.
2. Sanyal S, Ray S (2008) Age variation in menstrual characteristics of adolescent girls of West Bengal. *Singapore Medical Journal* 49(7): 542-550.
3. Mpora BE, Piloya T, Awor S, Ngwiri T, Laigong P, et al. (2014) Age at menarche in relation nutritional status and critical life events among rural and urban secondary school girls in post-conflict Northern Uganda. *BMC Women's Health* 14:66.
4. Dambhare DG, Wagh SV, Dudhe JY (2012) Age at menarche and menstrual cycle pattern among school adolescent girls in Central India. *Glob J Health Sci* 4(1): 105-111.
5. Ray S, Mishra S, Ghosh Roy A, Das BM (2010) Menstrual characteristics: A study of the adolescents

- of rural and urban West Bengal. *Ann Hum Biol* 37(5): 668-681.
6. Kanotra SK, Bangal VB, Bhavthankar DP (2013) Menstrual pattern and problems among rural adolescent girls. *IJBAR* 4(8): 551-554.
 7. Houston AM, Abraham A, Huang Z (2006) Knowledge, attitudes, and consequences of menstrual health in urban adolescent females. *J Pediatr Adolesc Gynecol* 19(4): 271-275.
 8. Meenal VK, Durge PM, Kasturwar NB (2012) Prevalence of Anemia among Adolescent girls in an Urban Slum. *National Journal of Community Medicine* 3(1): 106-111.
 9. Sheetu MK Jaikhani, Naik JD, Thakur MS, Langre SD, Pandey VO, et al. (2014) Patterns & Problems of Menstruation amongst the Adolescent Girls Residing in the Urban Slum. *Sch J App Med Sci* 2(2A): 529-534.
 10. Patil SN, Wasnik V, Wadke R (2009) Health problems amongst adolescent girls in the rural areas of the Ratnagiri district of Maharashtra. *Journal of Clinical and Diagnostic Research* 3(5): 1784-1790.
 11. Srivastava P, Varoda A, Venugopal R (2016) Menstrual cycle pattern among adolescent school girls in Chattisgarh. *The International Journal of Indian psychology* 3(3): 2348-5396.
 12. Paria B, Bhattacharya A, Das S (2014) A comparative study on menstrual hygiene among urban and rural adolescent girls of West Bengal. *J Family Med Prim Care* 3(4): 413-417.
 13. Jejeebhoy SJ, Sebastian MP (2003) Actions that protect: promoting sexual and reproductive health and choice among young people in India. *Regional working papers, South and East Asia*. New Delhi: Population Council.
 14. Deo DS, Gattarji CH (2004) Age at menarche and associated factors. *Indian J Pediatr* 71(6): 565-566.
 15. Delavar MA, Hajian-Tilaki KO (2008) Age at menarche in girls born from 1985 to 1989 in Mazandaran, Islamic Republic of Iran. *East Mediatr Health J* 14(1): 90-94.
 16. Mokha R, Kaur AI, Kaur N (2017) Age at menarche in Urban-Rural Punjabi Jat Sikh Girls. *The Anthropologist* 8(3): 207-209.
 17. Valvaikar KS, Shah HK (2016) An urban-rural comparison of menstrual pattern and menstrual problems among school-going girls. *Int J Med Sci Public Health* 5(10): 2086-2090.
 18. Sangwan G, Vashisht BM (2017) Menstrual pattern and prevalence of dysmenorrhea among school going adolescent girls in a rural block of Haryana: a cross sectional study. *GJMEDPH* 6(2): 1-5
 - 19.
 20. Kulkarni M, Durge PM (2011) Reproductive health morbidities among adolescent girls: breaking the silence. *Ethno Med* 5(3): 165-168.
 21. Patil MS, Angadi MM (2013) Menstrual pattern among adolescent girls in rural area of Bijapur. *Al Ameen J Med Sci* 6(1): 17-20.
 22. Sharma P, Malhotra CH, Taneja DK, Saha R (2008) Problems related to menstruation among adolescent girls. *Indian J Pediatr* 75(2): 125-129.
 23. Sarkar AP, Mandal R, Ghorai S (2015) Premenstrual syndrome among adolescent girl students in a rural school of West Bengal, India. *Int J Med Sci Public Health* 5(3): 408-411.
 24. Agarwal AK, Agarwal A (2010) A Study of Dysmenorrhea during Menstruation in Adolescent Girls. *Indian J Community Med* 35(1): 159-164.
 25. George NS, Priyadarshini S, Shetty S (2014) Dysmenorrhea among adolescent girls-characteristics and symptoms experienced during menstruation. *Nitte University Journal of Health Science* 4(3): 45-52.
 26. Konapur KS, Nagaraj C (2014) Dysmenorrhea and premenstrual syndrome: frequency and effect on daily activities of adolescent girls in rural areas of Bangalore. *Int J Med Sci Public Health* 3(10): 1225-1228.
 27. Omidwar S, Begum K (2010) Factors which influence the hygienic practices during menses among girls from south India: a cross sectional study. *International Journal of Collaborative Research on internal Medicine and Public Health* 2(12): 411-423.
 28. Sowmya BC, Manjunatha S, Kumar J (2014) Menstrual hygiene practices among adolescent girls: a cross

- sectional study. *J of Evolution of Med and Dent Sci* 3(28): 7955-7961.
29. Kandpal J, Sharma MDS, George U (2018) A study to assess the practice to menstrual hygiene among adolescent girls in selected area, Dehradun, Uttarakhand. *IOSR-JNHS* 7(1): 1-5.
 30. Khanna A, Goyal RS, Bhawsar R (2005) Menstrual practices and reproductive problems: a study of adolescent girls in Rajasthan. *Journal of Health Management* 7(1): 91-107.
 31. Dasgupta A, Sarkar M (2008) Menstrual hygiene: how hygienic is the adolescent girl? *Indian J of Community med* 33(2): 77-80.
 32. Raina D, Balodi G (2014) Menstrual hygiene: knowledge, practice and restrictions amongst girls of Dehradun, Uttarakhand, India. *GJISS* 3(4): 156-162.
 33. Wasnik VR, Dhumale D, Jawarkar AK (2015) A study of the menstrual pattern and problems among rural school going adolescent girls of Amravati district of Maharashtra, India. *International Journal of Research in Medical Sciences* 3(5): 1252-1256.
 34. Gupta S, Sinha A (2006) Awareness about reproduction and adolescent changes among school girls of different socioeconomic status. *J Obstet Gynecol India* 56(4): 324-328.
 35. Thakre SB, Thakre SS, Reddy M, Rathi N, Pathak Ketaki, et al. (2011) Menstrual hygiene: knowledge and practice among adolescent school girls of Saoner, Nagpur district. *Journal of Clinical and Diagnostic Research* 5(5): 1027-1033.
 36. Mudey AB, Keshwani N, Mudey GA, Goyal RC (2010) A cross-sectional study on the awareness regarding safe and hygienic practices amongst school going adolescent girls in the rural areas of Wardha district. *Global Journal of Health Science* 2(2): 225-231.

