

Original Research Article

Menstrual hygiene practices among adolescents of selected tea estates of Golaghat District, Assam, with a view to provide awareness on menstrual health and hygiene: a descriptive study

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ABSTRACT

Background: Menstruation is a normal biological process, and adolescent girls often are unaware when they experience menarche. Unhygienic menstruation can cause severe health risks, which may lead to respiratory tract infections (RTIs) and urinary tract infections (UTIs), and further may result in infertility and complications during birthing process. Menstruation is still a taboo in many parts of India and women are still behaved in a different way when on periods.

Methods: A descriptive study was conducted in selected tea-estates of Golaghat district, Assam from 21 September 2024 to 17 January 2025 among 759 adolescents aged 10-19 year fulfilling the sample selection criteria using multi-stage random sampling technique. Self-structured socio-demographic questionnaires and standardized open access, Menstrual practice needs scale 36 tool was administered and an awareness program on menstrual health and hygiene was given to them thereafter.

Results: The study findings reveal that menstrual hygiene practice need was found to be significantly associated with religion, monthly family income, type of material used during menstruation, disposal method of used menstrual material, education, residence, source of information about menstruation, type of family, age and frequency of changing of menstrual materials once get wet in a day.

Conclusions: Improvement in menstrual health and hygiene practices among adolescents of tea-estates can be established by promoting overall well-being, dignity and empowerment of adolescents.

Keywords: Menstrual hygiene practice, Adolescents, Tea-estates

INTRODUCTION

Adolescence is narrowly equated with puberty and the cycle of changing physically culminates in reproductive maturity.¹ Every month 1.8 billion people across the world menstruate and on any given day more than 300 million women worldwide are menstruating. An estimated 500 million lack access to menstrual materials and adequate facilities for menstrual hygiene management. There are millions around the world who are denied from the right to manage their menstruation monthly in a dignified and healthier way.²

Menstruation is a normal biological process and female adolescents often are unaware when they experience menarche. This diminishes their confidence, self-esteem and often causes fear and distress. Unhygienic menstruation such as prolonged use of same menstrual product or not washing the genital area daily, can cause severe health risks which may lead to respiratory tract infections (RTIs) and urinary tract infections (UTIs), and further may result in infertility and complications during birthing process. Soiled menstrual blood materials serve as breeding grounds for pathogens such as *Salmonella*, *Staphylococcus* and *E. coli* which can grow quickly in the reproductive system, starting with the cervix and progressing higher. Menstruation is still a taboo in many

parts of India and females are still treated in a different way during periods.³

Globally, the state Assam, situated in the north-eastern region of India is called as the land of the tea. However, the community people who are working in these tea estates and companies are some of the most underprivileged groups, living under miserable condition in terms of health and sanitation. Adolescent girls of these communities are extremely at risk to menstruation problems and unhygienic practices due to lack of awareness and multiple social beliefs that makes a woman impure during menstruation. This often leads to early school dropout among adolescent females, many health related problems like anaemia, dysmenorrhea.⁴ Healthy menstrual hygiene practice interventions can help overcome these obstacles to fulfil the unmet demand for menstrual hygiene materials in order to protect dignity, build confidence, and strengthen sexual and reproductive health, particularly among adolescents.

METHODS

A descriptive non-experimental research design was adopted to conduct the study among adolescent girls aged 10-19 years in selected tea-estates of Golaghat district, Assam from 21 September 2024 to 17 January 2025 (4 months).

Sample size

Considering 67% as the prevalence of menstrual hygienic practices among adolescent females in Assam according to the National Family Health Survey-V, assuming it as a baseline for present study a minimum sample of 700 was calculated with 95% confidence, 80% power allowing 5% margin of error, a sample of 759 was selected for the study using multi-stage random sampling technique.

Inclusion criteria

Adolescent girls (10-19 years) who were residing in selected tea estates as well as their surrounding areas of Golaghat district, Assam, present at the time of data collection and physically and mentally sound fulfilled the inclusion criteria of the study.

Exclusion criteria

Adolescents who had not attained menarche, married, pregnant and lactating women were excluded in the study.

After acquiring the ethical and formal permission from the Manager of the Teagarden, participants were informed to gather in a designated place of the tea garden and assent were obtained from them and consent from their parents. A socio-demographic proforma was used in the study which comprises of general information (7 items) and menstruation related proforma (5 items) and standardized tool, menstrual practice needs scale was administered to the participants which took approximately 60 minutes to

complete followed by an awareness program on menstrual health and hygiene. It was developed with a view to aware the target population on one of the common problems of adolescents i.e., menstrual health and hygiene.

Statistical analysis

Data were obtained using Microsoft excel 2007 and tabulated, analysed and interpreted by using statistical package for the social sciences (SPSS) 20. For descriptive analysis of socio-demographic variables and Menstrual practice needs scale mean, frequency, percentage and SD was used. Chi-square test was done to analyze the association between different variables for inferential statistics.

RESULTS

The study included 759 adolescents which studied various socio-demographic characteristics. Table 1 shows general information of socio-demographic findings, majority 363 (47.80%) were 14-16 years age, 612 (80.6%) religion were Hindu, 430 (56.70%) education were Secondary education, 675(88.9%) were residing in own residence, 525 (69.2%) were from nuclear family, 268 (35.30%) mother's had no formal education, 471 (62.1%) monthly family income belongs to upper class (9098 and above).

Table 2 shows menstruation related proforma of socio-demographic variables, majority 242 (31.9%) age of menarche was 12 years, 573 (75.5%) source of information about menstruation were teacher, parents, friends and neighbours, 440 (58.9%). Type of material used during menstruation was cloth, 358 (47.2%) frequency of changing of menstrual materials once get wet in a day were less than 2 times, 318(41.9%) disposal method of used menstrual materials was dumping in the pit.

Figure 1 shows the range, mean and SD of the domains of MPNS-36 i.e., material and home environment needs with 11 questions which are about the extent the participants are satisfied with their needs met with their menstrual products, preference for disposal and environment they are using at home during periods. The minimum score of the participant is 0.00 and maximum score is 33.00 with mean and SD 24.28±4.55 which indicates menstrual practice needs were met in this domain.

Transport and school environment needs has 5 questions where participants needs were met with transportation and changing materials at school. The minimum score of the participant is 0.00 and maximum score is 15.00 with mean and SD 7.67±3.44 which indicates menstrual practice needs were met in this domain.

Material reliability concerns has 3 questions with reverse scoring, which comprises of questions to know participants worries about the quality of their menstrual materials (that they might leak, or run out of materials, or materials would move out of place). The minimum score of the participant

is 0.00 and maximum score is 9.00 with mean and SD 4.25 ± 2.28 which denotes menstrual practice needs were unmet in this domain.

Table 1: General information of socio-demographic variables.

Socio-demographic variables (general information)	Frequency (n=759)	%
Age (years)		
10-13	174	22.9
14-16	363	47.8
17-19	222	29.2
Religion		
Hindu	612	80.6
Islam	41	5.4
Christian	106	14
Education		
No formal education	22	2.9
Primary education	189	24.9
Secondary education	430	56.7
Higher secondary education	118	15.5
Residence		
Company quarter	70	9.2
Own residence	675	88.9
Others	14	1.8
Type of family		
Nuclear	525	69.2
Joint	175	23.1
Extended	59	7.8
Education of mother		
No formal education	268	35.3
Primary education	264	34.8
Secondary education	190	25.0
Higher secondary education	37	4.9
Monthly family income		
Upper class (Rs. 9098 and above)	471	62.1
Upper middle class (Rs. 4549-9097)	287	37.8
Middle class (Rs. 2729-4550)	1	0.1

Change and disposal insecurity has 9 questions to which participants' worries and concerns that they might not be able to change or dispose off materials when they needed to, and their concerns about privacy and safety during menstruation both at home and school. The minimum score of the participant is 0.00 and maximum score is 27.00 with mean and SD 15.15 ± 6.24 which indicates menstrual practice needs were met in this domain.

Figure 1 also shows that 436 participants out of 759 reuse their menstrual materials and are further assessed for their reuse menstrual practice needs i.e., reuse needs and reuse insecurity. Reuse needs comprises of 5 questions applied to those who reused materials and captured the extent to which participants were satisfied with in relation to

washing and drying them. The minimum score of the participant is 0.00 and maximum score is 15.00 with mean and SD 12.02 ± 3.41 which indicates menstrual practice needs were met in this domain.

Table 2: Menstruation related proforma of socio-demographic variables.

Socio-demographic variables (menstruation related preform)	Frequency (n=759)	%
Age of menarche (years)		
10	38	5.0
11	77	10.1
12	242	31.9
13	220	29.0
14	104	13.7
15	30	4.0
16	48	6.3
Source of information about menstruation		
Health personnel	100	13.2
Mass media (television, radio, internet)	24	3.2
Print media (newspaper, books, journal)	43	5.7
Teacher, parents, friends, neighbours	573	75.5
No source of information	19	2.5
Type of material used during menstruation		
Sanitary pad	217	28.6
Cloth	440	58.0
Both sanitary pad and cloth	102	13.4
Frequency of changing of menstrual material once get wet in a day (times)		
<2	358	47.2
2-5	278	36.6
>5	123	16.2
Disposal method of used menstrual material		
Wash and dry in the sunlight	176	23.2
Dump in the pit	318	41.9
Open space disposal	116	15.3
Burn the menstrual materials	149	19.6

Reuse insecurity has 3 questions with reverse scoring, which comprises of questions applicable to those who reused materials and captured concerns around washing and drying them. The minimum score of the participant is 0.00 and maximum score is 9.00 with mean and SD 1.83 ± 2.24 which indicates menstrual practice needs were unmet in this domain.

Association of menstrual practice need scale with socio-demographic variables

Statistical inference as shown in Table 3 where menstrual practice need scale was found to be associated significantly with religion $\chi^2 (4, 759)=56.15$, $p<0.001$, monthly family income $\chi^2 (4, 759)=21.93$, $p<0.001$, type of material used

during menstruation χ^2 (4, 759)=60.75, $p<0.001$, disposal method of used menstrual material χ^2 (4, 759)=46.16, $p<0.001$, education χ^2 (6, 759)=22.03, $p=0.001$, residence χ^2 (4, 759)=13.36, $p=0.010$, source of information about menstruation χ^2 (8, 759)=20.14, $p=0.010$, type of family χ^2 (4, 759)=11.55, $p=0.021$, marginally significant with age χ^2 (4, 759)=8.70, $p=0.069$, and frequency of changing of menstrual materials once get wet in a day χ^2 (4, 759)=9.00, $p=0.061$.

Association of all domains of menstrual practice need scale with socio-demographic variables

Table 4 shows association of all 6 domains of menstrual practice need scale with socio-demographic variables. MPNS-36 scale domain i.e., material and home environment needs was found to be statistically associated with residence χ^2 (4, 759)=17.38, $p=0.002$, monthly family income χ^2 (4, 759)=15.48, $p=0.004$, source of information about menstruation χ^2 (8, 759)=29.94, $p<0.001$, type of material used during menstruation χ^2 (4, 759)=32.68, $p<0.001$, frequency of changing of menstrual materials once get wet in a day χ^2 (4, 759)=12.24, $p=0.016$, disposal method of used menstrual material χ^2 (6, 759)=29.58, $p<0.001$, marginally associated with religion χ^2 (4, 759)=9.19, $p=0.057$.

MPNS-36 scale domain i.e., transport and school environment needs was found to be statistically associated with age χ^2 (4, 759)=11.36, $p=0.023$, religion χ^2 (4, 759)=41.26, $p<0.001$, education χ^2 (6, 759)=48.02, $p<0.001$, type of family χ^2 (4, 759)=15.94, $p=0.003$, education of mother χ^2 (6, 759)=27.98, $p<0.001$, age of menarche χ^2 (12, 759)=27.67, $p=0.006$, source of information about menstruation χ^2 (8, 759)=20.85, $p=0.008$, type of material used during menstruation χ^2 (4, 759)=10.36, $p=0.035$, and disposal method of used menstrual material χ^2 (6, 759)=17.95, $p=0.006$. It was found to be marginally significant with residence χ^2 (4, 759)=9.17, $p=0.057$.

MPNS-36 scale domain i.e., material reliability concerns was found to be statistically associated with age χ^2 (4, 759)=18.44, $p=0.001$, religion χ^2 (4, 759)=68.41, $p<0.001$, education χ^2 (6, 759)=30.81, $p<0.001$, source of information about menstruation χ^2 (8, 759)=35.96, $p<0.001$, type of material used during menstruation χ^2 (4, 759)=15.95, $p=0.003$, frequency of changing of menstrual materials once get wet in a day χ^2 (4, 759)=23.49, $p<0.001$ and disposal method of used menstrual material χ^2 (6, 759)=29.25, $p<0.001$. It was seen that marginally significant with type of family χ^2 (4, 759)=8.47, $p=0.076$.

MPNS-36 scale domain i.e., change and disposal insecurity was found to be statistically associated with age χ^2 (4, 759)=18.5, $p=0.001$, religion χ^2 (4, 759)=157.32, $p<0.001$, education χ^2 (6, 759)=57.35, $p<0.001$, type of family χ^2 (4, 759)=12.09, $p=0.017$, education of mother χ^2 (6, 759)=18.73, $p=0.005$, monthly family income χ^2 (4, 759)=27.1, $p<0.001$, age of menarche χ^2 (12, 759)=31.77,

$p=0.002$, source of information about menstruation χ^2 (8, 759)=27.77, $p=0.001$, type of material used during menstruation χ^2 (4, 759)=36.83, $p<0.001$, frequency of changing of menstrual materials once get wet in a day χ^2 (4, 759)=19.01, $p=0.001$, disposal method of used menstrual material χ^2 (6, 759)=20.25, $p=0.002$. However it was found to be marginally associated with residence χ^2 (4, 759)=8.01, $p=0.091$.

MPNS-36 scale domain i.e., reuse needs was found to be statistically associated with religion χ^2 (2, 759)=12.03, $p=0.002$, residence χ^2 (2, 759)=13.02, $p=0.001$, type of family χ^2 (2, 759)=7.43, $p=0.024$, education of mother χ^2 (3, 759)=14.91, $p=0.002$, monthly family income χ^2 (2, 759)=6.96, $p=0.031$, type of material used during menstruation χ^2 (2, 759)=241.32, $p<0.001$, disposal method of used menstrual material χ^2 (3, 759)=83.74, $p<0.001$. The same was found to be marginally statistically associated with source of information about menstruation χ^2 (4, 759)=8.65, $p=0.070$, and frequency of changing of menstrual materials once get wet in a day χ^2 (2, 759)=4.76, $p=0.093$.

MPNS-36 scale domain i.e., reuse insecurity was found to be statistically associated with religion χ^2 (4, 759)=28.22, $p<0.001$, education χ^2 (6, 759)=18.67, $p=0.005$, education of mother χ^2 (6, 759)=24.4, $p<0.001$, monthly family income χ^2 (4, 759)=14.37, $p=0.006$, source of information about menstruation χ^2 (8, 759)=19.83, $p=0.011$, type of material used during menstruation χ^2 (4, 759)=275.01, $p<0.001$, disposal method of used menstrual material χ^2 (6, 759)=107.98, $p<0.001$. Marginal significance was found between reuse insecurity and residence χ^2 (4, 759)=7.87, $p=0.097$, type of family χ^2 (4, 759)=7.97, $p=0.093$ and frequency of changing of menstrual materials once get wet in a day χ^2 (4, 759)=7.9, $p=0.095$.

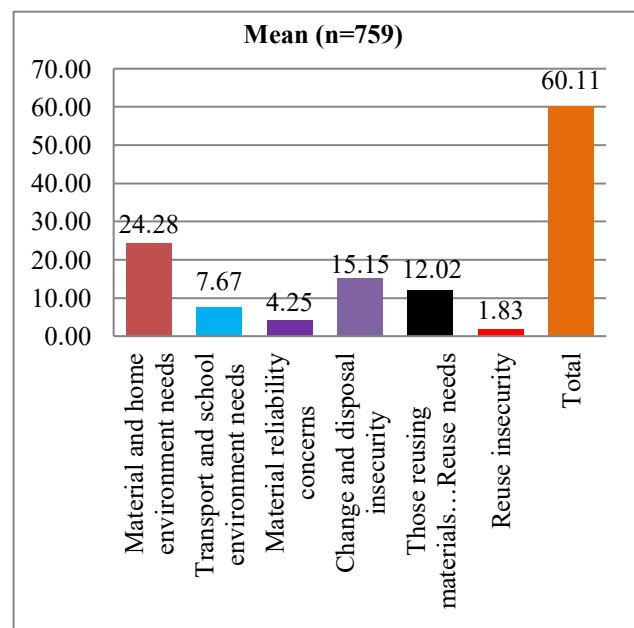


Figure 1: Domain wise average score of participants as per MPNS-36.

Table 3: Association of menstrual practice need scale with socio-demographic variables (n=759).

Socio-demographic variables	Menstrual practice need scale			Total	χ2	df	P value
	Low	Medium	High				
Age (years)							
10-13	37	117	20	174	8.70	4	0.069 ^{MS}
14-16	61	255	47	363			
17-19	25	160	37	222			
Religion							
Hindu	107	439	66	612	56.15	4	<0.001***
Islam	11	29	1	41			
Christian	5	64	37	106			
Education							
No formal education	9	11	2	22	22.03	6	0.001**
Primary education	33	136	20	189			
Lower secondary education	71	303	56	430			
Higher secondary education	10	82	26	118			
Residence							
Company quarter	20	46	4	70	13.36	4	0.010**
Own residence	99	477	99	675			
Others	4	9	1	14			
Type of family							
Nuclear family	86	357	82	525	11.55	4	0.021*
Joint family	22	134	19	175			
Extended family	15	41	3	59			
Education of mother							
No formal education	42	195	31	268	5.29	6	0.507 ^{NS}
Primary education	37	186	41	264			
Lower secondary education	35	128	27	190			
Higher secondary education	9	23	5	37			
Monthly family income							
Upper class (Rs. 9098 and above)	82	343	46	471	21.93	4	<0.001***
Upper middle class (Rs. 4549-9097)	40	189	58	287			
Middle class (Rs. 2729-4550)	1	0	0	1			
Age of menarche (years)							
10	3	29	6	38	17.59	12	0.129 ^{NS}
11	13	54	10	77			
12	40	176	26	242			
13	34	159	27	220			
14	24	64	16	104			
15	2	21	7	30			
16	7	29	12	48			
Source of information about menstruation							
Health personnel	28	62	10	100	20.14	8	0.010*
Mass media (television, radio, internet)	2	18	4	24			
Print media (newspaper, books, journal)	4	37	2	43			
Teacher, parents, friends, neighbours	88	399	86	573			
No source of information	1	16	2	19			
Type of material used during menstruation							
Sanitary pad	19	144	54	217	60.75	4	<0.001***
Cloth	100	304	36	440			
Both sanitary pad and cloth	4	84	14	102			
Frequency of changing of menstrual materials once get wet in a day (times)							
<2	59	252	47	358	9.00	4	0.061 ^{MS}

Continued.

Socio-demographic variables	Menstrual practice need scale			Total	χ^2	df	P value
	Low	Medium	High				
2-5	49	182	47	278	46.16	6	<0.001***
>5	15	98	10	123			
Disposal method of used menstrual material							
Wash and dry in the sunlight	22	118	36	176			
Dump in the pit	66	228	24	318			
Open space disposal	26	64	26	116			
Burn the menstrual materials	9	122	18	149			

^{NS}Not significant, $p>0.05$, ^{MS}marginally significant, $p>0.05$ but <0.10 , *significant, $p<0.05$, **highly significant, $p<0.01$, ***very highly significant, $p<0.001$

Table 4: Association of all domains of menstrual practice need scale with socio-demographic variables (n=759).

Socio-demographic variables	P value						
	Material and home environment needs	Transport and school environment needs	Material reliability concerns	Change and disposal insecurity	Reuse needs	Reuse insecurity	Overall menstrual hygiene practice
Age	0.631 ^{NS}	0.023*	0.001**	0.001**	0.587 ^{NS}	0.314 ^{NS}	0.069 ^{MS}
Religion	0.057 ^{MS}	<0.001***	<0.001** *	<0.001***	0.002* *	<0.001***	<0.001***
Education	0.150 ^{NS}	<0.001***	<0.001** *	<0.001***	0.534 ^{NS}	0.005* *	0.001***
Residence	0.002**	0.057 ^{MS}	0.378 ^{NS}	0.091 ^{MS}	0.001* *	0.097 ^{MS}	0.010**
Type of family	0.37 ^{NS}	0.003**	0.076 ^{MS}	0.017*	0.024*	0.093 ^{MS}	0.021*
Education of mother	0.274 ^{NS}	<0.001***	0.530 ^{NS}	0.005**	0.002* *	<0.001***	0.507 ^{NS}
Monthly family income	0.004**	0.614 ^{NS}	0.652 ^{NS}	<0.001***	0.031*	0.006* *	<0.001***
Age of menarche	0.536 ^{NS}	0.006**	0.132 ^{NS}	0.002**	0.457 ^{NS}	0.593 ^{NS}	0.129 ^{NS}
Source of information about menstruation	<0.001***	0.008**	<0.001** *	0.001**	0.070 ^{MS}	0.011*	0.010*
Type of material used during menstruation	<0.001***	0.035*	0.003**	<0.001***	<0.001***	<0.001***	<0.001***
Frequency of changing of menstrual materials once get wet in a day	0.016*	0.102 ^{NS}	<0.001** *	0.001**	0.093 ^{MS}	0.095 ^{MS}	0.061 ^{MS}
Disposal method of used menstrual material	<0.001***	0.006**	<0.001** *	0.002**	<0.001***	<0.001***	<0.001***

^{NS}Not significant, $p>0.05$, ^{MS}marginally significant, $p>0.05$ but <0.10 , *significant, $p<0.05$, **highly significant, $p<0.01$, ***very highly significant, $p<0.001$

DISCUSSION

The present study shows that overall mean and SD of MPNS-36 is 60.11 ± 13.45 , domains of MPNS-36 i.e., material and home environment needs 24.28 ± 4.55 , Transport and school environment needs 7.67 ± 3.44 , material reliability concerns 4.25 ± 2.28 , change and disposal insecurity 15.15 ± 6.24 , Those reusing materials i.e., reuse needs 12.02 ± 3.41 and reuse insecurity 1.83 ± 2.24 . The result is contrast with the findings of the study conducted by Rupe et al on menstrual health

among adolescents and young adults where the overall mean MPNS-36 score was 2.2 (SD:0.33); 68% of participants had a mean MPNS-36 score of 3 or less, indicating unmet MH needs.

The mean score and SD for materials and home environment was 2.3 (SD: 0.16), transport and school environment needs was 2 (SD: 0.24), menstrual reliability concerns were 1.8 (SD: 0.17), change and disposal security was 2.2 (SD: 0.17), reuse needs was 2.7 (SD: 0.18) and reuse insecurity was 1.9 (SD: 0.34).⁵

Discussion on association of menstrual practice needs scale with socio-demographic variables

The study finding reveals a significant association between socio-demographic variables i.e., religion monthly family income, type of material used during menstruation, disposal method of used menstrual material, education, residence, source of information about menstruation, type of family, marginally significant with age and frequency of changing of menstrual materials once get wet in a day with menstrual practice needs scale. Similar study conducted by Baruah et al on knowledge and practice on menstrual hygiene among girl students which reveals a significant association between practice and demographic variables religion and family income, and further contrasted where there was no significant association between practice and demographic variables of age of the girl, age at menarche, type of family, education of the mother, occupational status of father and mother, and information received on menstruation hygiene.⁶

Similar study conducted by Siabani et al showed that the participants practice regarding menstruation was significantly associated with age and mother's education ($p \leq 0.05$).⁷ In a cross sectional study done by Sarkar et al at West Bengal also showed that there was an association between the type of family and good menstrual hygiene practices.⁸

CONCLUSION

Menstruation in adolescence is a normal physiological process that begins in menarche and continues throughout the reproductive years. There is nothing to feel anxious, scared or embarrassed about it. While irregular periods are common initially, understanding the normal cycle, menstrual hygiene and potential concerns like dysmenorrhea is crucial for adolescent's well-being and overall health.

The study highlights the need for improved menstrual health and sanitation among adolescents of tea-estates. This study revealed a scenario of adolescent girls living in tea-garden communities of Assam and their different challenges faced during their menstruation. Thus it can be concluded that by prioritizing menstrual health and hygiene we can promote overall well-being, dignity and empowerment of adolescents.

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Ethical approval: The study was approved by the Institutional Ethics Committee

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