

# DETERMINANTS OF MENSTRUAL HYGIENE AMONG ADOLESCENT GIRLS: A MULTIVARIATE ANALYSIS

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## ABSTRACT

**Background:** Menstrual hygiene is an issue that is insufficiently acknowledged. Lack of adequate privacy and sanitation of toilets for school girls; make them vulnerable to mental, emotional and physical problem especially during their menstruating days.

**Objectives:** To identify the issues and challenges of menstruation faced by the adolescent girls, to determine the factors behind the existing practices of menstrual hygiene and to find out the proportion of the study population complaining of symptoms related to genitourinary tract and related health care seeking behavior.

**Methods:** A descriptive, cross-sectional study was conducted among 190 adolescent girls of a rural secondary school of West Bengal.

**Results:** Out of 190 respondents, 80(42%) girls were aware about menstruation prior to attainment of menarche. After bivariate analysis, the significant risk factors of good menstrual hygiene were entered into the multivariate model. It revealed that good menstrual hygiene was more among those whose mothers were literate [AOR 2.3 (1.06-5.01)], girls studying in more than grade X in school [AOR 2.71(1.16-6.35)], having prior knowledge about menstruation before menarche [AOR 2.97(1.29-6.85)], usage of proper sanitary latrine at home [AOR 3.14(1.42-6.00)] and exposure to advertisements promoting usage of sanitary towels in mass media [AOR-2.52(1.10-5.70)].

**Conclusions:** Adoption of high quality menstrual hygiene will play an important role in prevention of RTI and Cancer of cervix among the women population. Therefore promoting positive attitudes towards management of menstruation and related problems among the adolescent girls is the need of the hour.

**Keywords:** Adolescent girls, menstrual hygiene, knowledge and practices, sanitary napkin

## INTRODUCTION

Menarche is a milestone in a woman's life as it denotes the start of reproductive capacity. Unfortunately, however, there is gross lack of information on menstrual preparedness and management among adolescent girls, a situation made worse by the shyness and embarrassment with which discussions about menstruation is treated.

It is worthwhile to mention that poor menstrual hygiene comes in the way of achieving the several Millennium Development Goals like MDG 2,3,5,7 and 8<sup>1</sup>

- MDG 2 (Achieve universal primary education) Menstruation is an important

cause of absenteeism and even school dropout

- MDG 3 (promotes gender equality and empower women). Taboos and misconceptions regarding menstruating girls and menstrual hygiene evolves in gender inequality<sup>3</sup> and degradation of women empowerment
- MDG 5 (Improve maternal health) Poor menstrual hygiene causes Reproductive Tract Infection which is a morbidity that is suffered by many women with hushed silence. Cancer of the cervix, which is the commonest cause of cancer among women in India is another morbidity whose risk factor is poor reproductive tract hygiene.

Very recently ARSH of NRHM is promoting menstrual hygiene through free distribution of sanitary napkins to adolescent girls especially in rural areas.

- MDG 7: Ensure environmental sustainability. Indiscriminate disposal of sanitary napkins and other absorbent materials is not ecologically friendly.
- MDG 8:(Global partnership for development).Absence of a structured program or policy for upliftment of menstrual hygiene, thus neglecting MDG 8.

With this backdrop a study was conducted among adolescent girls in a rural school of West-Bengal with the following objectives

### OBJECTIVES

1. To identify the issues and challenges of menstruation encountered by the adolescent girls.
2. To determine the factors affecting the existing practices of menstrual hygiene.
3. To find out the proportion of the study population complaining of symptoms related to genito-urinary tract infection and related health care seeking behavior.

### METHODOLOGY

The study was conducted for a period of 3 months in a school named -Paltagarh High School in Singur Block of Hoogly district, West Bengal.

**Sample size**= $4pq/d^2$  [Prevalence of Unhygienic Practices=48.75%  $\phi$ 100 d=absolute precision of 10] So, the minimum sample size came to be 100, but to increase the power of the study 190 girls in the survey Sampling-At first all the 400 girls

of classes ix,x,xii and xii was age wise stratified into two groups. The first group consisted of 168 girls of 13-15yrs and second group 232 girls of 15-19yrs. Then probability proportionate to size sampling technique was adopted and 84 girls were picked in age group 13-15 yrs for interview ,out of which only 80 consented. In the age group of 15-19yrs, a sample of 116 girls was drawn, out of which 110 consented. So the total sample population consisted of 190 (80+110) adolescent girls.

### Study tool:

**Quantitative:** A self-administered pre-tested structured close-ended questionnaire for interview. **Validity and reliability of the questionnaire-** A questionnaire was designed on 20 students with similar characteristics of those in the main study for content validation. The Corn bach-Alpha measurement was used to determine the reliability of the questionnaire, which demonstrated a correlation of 90%.

**Qualitative:** Focus group discussions (FGD), and Semi-structured in-depth interviews. Qualitative study- 1.Four focus group discussions were conducted with representatives of each of the grades.10 girls were purposively selected from each grade to take part in focus group discussion.2.In depth interviews of 20 girls (five girls from each grade).

### Statistics

Data was analyzed using SPSS 19.0.

The data was analysed in two phases:

A. Perception regarding menstruation, and its determinants among the study population.

The students' knowledge and practices were scored using a scoring system as described below.

Items	No of questions	Maximum attainable score	Minimum attainable score	Maximum attained score	Minimum attained score
Knowledge	3	3	0	2	0
Practice	6	13	0	12	3
Total	9	16	0	7	13

- Median (inter quartile range) for attained score=9 (8-11)
  - So, the score below 9 was considered as poor score and  $\geq 9$  as good score
- B. Prevalence of symptoms related to genitourinary tract and its association with knowledge-practice of menstrual hygiene.

A. Descriptive data analysis was done to elicit the knowledge, belief and menstrual hygienic practices among the study population.

The knowledge and practice were scored and the cumulative score was calculated.

Firstly, a bivariate analysis was done to ascertain the association between good menstrual hygienic practices with variables. Only those found to be significant were entered into a multiple logistic model (LINK FUNCTION=LOGISTIC) by BACKWARD LR method. Diagnostic tests were done after modeling to assess goodness-of-fit and assumptions pertaining to logistic regression. Hosmer lemeshow goodness of fit for the model came to be a good fit with  $p > .04$  and Nagelkerke R square value came to be 0.314, which means around 31.4% of the variation can be explained by the study.

B. Prevalence of symptoms related to genitourinary tract was elicited among the study population and its risk of developing such morbidities was ascertained.

## RESULTS

**Table 1: Socio-demographic Characteristics of the Study Population (N=190)**

Variable	Frequency(%)
<b>Age (yrs)</b>	
13-15	80(42)
15-19	110(57)
<b>Sanitary latrine</b>	
Present	54(28.4)
Absent	136(71.6)
<b>Housing</b>	
Kuchha	20(10.5)
Pucca	57(30)
Mixed	113(59.5)
<b>Per capita income (Rs)</b>	
<500	15(7)
500-1000	150(80)
>1000	25(13)
<b>Mother's education</b>	
Literate	57(30)
Illiterate	133(70)
<b>Exposure to advertisements promoting use of sanitary pads in media (radio/television)</b>	
Present	76(40)
Absent	114(60)

Out of the 190 adolescent girls who participated in the study majority were in the age group of 15-19 yrs (57%). Most of them lived in Mixed houses (59.5%) and did not have sanitary latrine in their house (71.6%). About 80% of the study population had per capita income between Rs

600-Rs 1000 and more than half (60%) of the population was never exposed to advertisements in mass media regarding the usage of sanitary napkins.

Issues and challenges regarding menstruation was described under three broad themes

Table 2- Only 42% of the girls had knowledge about menstruation before their onset of menarche, the main source of knowledge being mother and sister (45%). About one third of the population did not have the correct knowledge of the actual cause of menstruation and only 17.9% of the adolescent girls knew that uterus was the source of blood in menstruation. Majority (62.6%) of the girls used only cloth as their menstrual absorbent.

**Table 2: Knowledge and Belief of the Study Population (N=190)**

Items	Number (%)
<b>Presence of Pre-menarchial Knowledge Regarding Menstruation</b>	80(42)
<b>Source of information</b>	
Mother and sister	36(45)
Friends and relatives	33(41.2)
Teachers and textbook	12(15)
Media	18 (22.5)
<b>Cause of menstruation</b>	
Hormone	114(60)
Don't Know	64(34)
Diseased	8(4)
Curse	4(2)
<b>Origin of blood</b>	
Don't know	22(11.6)
Uterus	34(17.9)
Urinary bladder	31(16.3)
Vagina	103(54.2)

Table 3- 52.1% of the girls washed the reusable cloth in pond water with soap and dried it inside the house where sunrays are coming (51.5%). With regards to the disposal of sanitary napkins and reusable cloth most of the girls threw them indiscriminately in a pond (53%) or in the nearby bamboo garden (45%). It is worthwhile to note that these ponds were being used for daily chores like washing of utensils, clothes or even for taking bath.

Table 4- Restricting sour food (80%) and not visiting temple (75.6%) have been the most common restrictions observed by the girls. About 38% of the girls reported of being absent

from school during their last menstrual period. Since their attainment of menarche all the girls reported to stay absent from school at some point of time during their menstruation. The main reasons for their absence were lack of proper disposal facility of sanitary napkins (75%) and lack of continuous water supply for washing (67.5%) in their school.

**Table 3: Practice of Menstrual Hygiene of the Adolescent Girls**

Practice	Number(%)
<b>Absorbent used during menstruation (N=190)</b>	
Only cloth	119(62.6)
Only sanitary napkin	25(13.2)
Both cloth and sanitary napkin	46 (24.2)
<b>Absorbent Change per day (N=190) Mean (<math>\pm</math>S.D)</b>	2.27( $\pm$ 0.90).
<b>Drying of washed reutilizable cloth (N=165)</b>	
Outside the house without sunlight	23(14)
Inside the house without sunlight	38(23)
Inside the house where sunrays are coming	85(51.5)
Outside the house under sunlight	19(11.5)
<b>Washing of reutilisable clothes (N=165)</b>	
Pond water with soap	86(52.1)
Pond water without soap	42(25.5)
Tap water with soap	20(12.1)
Tap water without soap	17(10.3)
<b>Disposal of menstrual absorbent (both cloth &amp; sanitary pad) (n=190)</b>	
Pond	101(53)
Garden	76(40)
Landfill	9(5)
In latrine	4(2)
<b>Reusable cloth Number of cycles used (n=165) Mean (<math>\pm</math>S.D)</b>	3.1( $\pm$ 1.42)
<b>Genitalia Cleaning per day during last menstrual cycle (N=190) Mean (<math>\pm</math>S.D)</b>	0.70( $\pm$ 0.85)

Table 5- The knowledge and practice regarding menstruation of the girls were scored and predictors of good score were elicited. All the significant predictors were then put into a multivariate model by applying backward LR method.

**Table 4: Experience of Seclusion, Exclusion and Absenteeism during Menstruation (N=190)**

Items	Number (%)
<b>Restrictions observed during menstruation*</b>	
Restricting sour food	152(80)
Not visiting temple	144(75.6)
Not picking flowers	128(67.5)
No cooking	86(45)
Not attending school	72(38)
None	2(3)
<b>Reasons for school absenteeism*</b>	
Lack of proper disposal facility for sanitary latrine	143(75)
Lack of continuous water supply	127(67.5)
Abdominal pain and physical comfort	124(65)
Grandmother told	89(47)
Fear of leakage	45(23.7)
Socially withdrawn during menstruation	10(5.4)

\*Total percentage will add upto more than 100% as there are multiple responses to this question

After bivariate analysis, the significant predictors of Good menstrual hygiene were entered into the multivariate model. It revealed that good menstrual hygiene was more among those whose mothers were literate [AOR (95% C.I) 2.3 (C.I.1.06-5.01)], girls studying in more than grade X in school [AOR 2.71(1.16-6.35)], having prior knowledge about menstruation before menarche [AOR 2.97(1.29-6.85)], presence of proper sanitary latrine at home [AOR 3.14(1.42-6.00)], exposure to advertisements regarding usage of sanitary napkins in mass media (radio/T.V)[AOR 2.52(1.1-2.57)].

Per capita income of Rs.1000 was found to be significantly associated with good menstrual hygiene only in bivariate analysis [O.R.(95% C.I) 7.39(2.76-20.14)] but not in multivariate analysis.

Table 6-About 18.4% of the girls complained of white discharge from the vagina and 10.5% reported burning sensation during micturition. These morbidities were significantly associated with Poor knowledge score O.R. (C.I) 4.67(1.6-14.3).

**Table 5: Determinants of menstrual hygiene among the adolescents adjusting for all factors (N=190)**

Variables		Number (%)	Good Score Median (inter quartilerange ) $\geq 9$ (8-11) Number (%)	Odds ratio (95% C.I.)	Adjusted odds ratio (95% C.I.)
Mother`s education	Literate	57(30)	24(42.1)	3.3	2.30
	Illiterate	133(70)	24(18.0)	(1.66-6.56)	(1.06-5.00)
Sanitary latrine	Present	54(28.4)	23(42.6)	3.2	3.14
	Absent	136(71.6)	25(18.4)	(1.64-6.58)	(1.42-6.90)
Grade in school	Above X	99(52.1)	36(36.4)	3.76	2.71
	Below X	91(47.9)	12(13.2)	(1.80-7.82)	(1.16-6.35)
Prior knowledge about menstruation	Present	80(42.1)	35(43.8)	5.8	2.97
	Absent	110(57.9)	13(11.8)	(2.8-12)	(1.29-6.85)
Exposure to advertisements promoting usage of sanitary napkins in mass-media (radio/television)	Present	76(40)	34(29.8)	1.88	2.52
	Absent	114(60)	14(18.4)	(0.93-3.81)	(1.1-5.7)

- In Bivariate analysis Per capita income was found to be significant  $P < .000$  with 16(64%) of the adolescents with P.C.I > Rs1000 had good menstrual hygienic practices. Odds ratio (95%.C.I) being 7.39(2.76-20.14),but it lost its significance when put in the multivariate model.

**Table 6: Association of Knowledge with Genito-urinary tract related morbidities of the Adolescent Girls**

Morbidities	Frequency (N=190) No (%)	Poor Knowledge practices score Median (inter quartile range) <9(8-11) No. (%)	Odds ratio (95%.C.I.)
White Discharge From Vagina(*RTI) Present	35(18.4)*	30(85.7)	2.3 (0.78-7.26)
Burning Sensation during Micturition (*UTI) Present	20(10.5)*	20(100)	
Total	55(28.9)	50(90.9)	4.67 (1.6-14.3)

\*All of them received treatment, the highest from homeopathic providers (64%) While 9% opted to go to nearby health centre and only 27% preferred to consult the local practitioners.

**FGD-** was conducted to elicit the issues and challenges regarding menstruation based on the three broad themes mentioned above.

Theme 1: Knowledge, belief and reaction on the first day of menstruation

- Young girls shared that they were not told anything specific about menstruation, especially the physiological basis - e.g. where the menstrual flow comes from - until their first personal experience of menstruation.
- Majority of the girls described the onset of menarche as a shocking ,fearful event .
- Some of them girls quoted that they were confused and even scared at the sight of

blood, while others were of the opinion that the intense abdominal pain was an issue of concern and they considered it as a pathological event

- 2. Seclusion, Exclusion and Absenteeism.
- FGD revealed that most of the girls do not attend school during their menstruation as the bathrooms do not have proper bins to dispose off the pads. Some of them even reported to carry the absorbent material back to their home due to lack of proper disposal facility
- They stated the bathrooms were in very insanitary condition (cleaned only on weekends) and none of them had any doors.

Moreover, water supply was not continuous so that hand washing after using the toilet was often skipped. All these prevented them from attending school during their menstruating days.

- They quoted `` we throw it in the toilet pan but it's difficult to flush due to lack of constant water supply. Sometimes we also throw it outside the toilet window``
- Some of them even reported to carry it back from their school in their school bags and disposed it after returning from school, while others reported to "simply throw them off the toilet window"
- ``It's difficult to carry reusable cloth to school and dispose them off –so we prefer being absent``. As quoted by one of the girls.

### 3. Practice of menstrual hygiene

- Most of the important reasons for not using sanitary towels were high cost of the sanitary pads, embarrassment to buy them and lack of knowledge of method of using them.
- Some of the girls even stated that it was traditional for them to use cloth as their mothers have also been using that .
- Most of the girls quoted that after drying the reusable cloth, most of them kept the cloths in the crevices of the wall, or in the ceiling panes and other dusty places which are not cleaned regularly, before their next use to hide it from the eyes of the male members of the house.

## DISCUSSION

Only 42.1% girls had prior knowledge about menstruation before menarche in this study in contrast to a similar study conducted by Dasgupta A. et al<sup>6</sup> where 32.5% had prior knowledge on menstruation. It is desirable that each and every girl child should be aware about menstruation, which is an important event at the threshold of adolescence and ideally before the attainment of menarche. Before bringing any change in menstrual practices, the girls should be educated about the facts of menstruation, physiological implications, about the significance of menstruation and above all, about proper hygienic practices with selection of disposable sanitary menstrual absorbent. Mothers must play a very important role for

their health education freely discussing all aspects of menstrual matters including clean practices without any hesitation with her daughter before her attainment of menarche. The next best are the teachers who may conduct classes on menarche, menstrual hygiene, RTI/STI under the routine school curriculum. However, mother was the first informant only in case of 45% girls similar to Dasgupta<sup>6</sup> et al study where 37.5% cases mother was the key informant. This gap noted in the present study suggests that poor literacy and socio-economic status of mothers have fuelled the inhibitions a mother has to talk to her daughter regarding menarche and the significance of menstrual hygienic. This will play a long way in maintaining a healthy reproductive tract for each and every girl child who, after she becomes a mother, percolates the healthy message to her female offspring. In a study conducted among 664 schoolgirls aged 14-18 in Mansoura, Egypt by El-Gilany *et al.*<sup>7</sup>, mass media were the main source of information about menstrual hygiene, followed by mothers. In this study however mass media constituted the source of knowledge in case of 24% adolescent girls. Another study conducted by Deo *et al.*<sup>8</sup> reported that 40 (42.5%) urban and 41 (55.4%) rural girls were aware about menstruation prior to attainment of menarche. In a study conducted in Rajasthan by Khanna *et al.*<sup>9</sup>, nearly 92% of the girls were not aware about the natural phenomenon of menstruation during menarche among women and most of the girls got first information about menstruation from their mothers with other major informants being sisters and friends.

It was observed in this study that 87% girls believed menstruation to be a physiological process, whereas in a similar study conducted in Rajasthan by Khanna *et al.*<sup>9</sup> nearly 70% believed that menstruation was not a natural process. 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 17.9% knew that the source of blood was uterus.

The above observation might be due to poor literacy level of mothers or absence of proper health education programmes in school focusing on menstrual hygiene.

Majority of the girls preferred cloth pieces rather than sanitary pads as menstrual absorbent. More than half of the girls were ignorant about the use of sanitary pads during menstruation. Only 13.2% girls used only sanitary pads during

menstruation and around 24.2% used both reusable cloth and sanitary pad. Apparently, poverty, high cost of disposable sanitary pads and to some extent ignorance dissuaded the study population from using the menstrual absorbents available in the market. In a study conducted in Rajasthan by Khanna *et al.*<sup>9</sup>, three-fourths of the girls used old cloth during their periods and only one-fifth reported using readymade sanitary pads.

It was observed in the present study that the usual practice was to wash the cloth with soap in the pond after use and keep it at some secret place till the next menstrual period. To keep the cloth away from prying eyes, these were sometimes hidden in unhygienic places. Privacy for washing, changing or cleaning purpose is something very important for proper menstrual hygiene, but in this study, lack of privacy was an important problem both at home and at school.

In a similar study conducted among 664 schoolgirls aged 14-18 years in Mansoura, Egypt by El-Gilany *et al.*<sup>7</sup> the different aspects of personal hygiene were generally found to be poor, such as not changing pads regularly or at night, and not bathing during menstruation with lack of privacy being an important problem.

Many restrictions were imposed on the girls in the present study, like not visiting temple, avoiding sour food, not attending school being most common. This is very similar to the study conducted by Dasgupta *et al.* where not performing religious rituals was found to be the most common restriction observed and

16 % of the girls reported school absenteeism in contrast to 39% in the present study, the possible reason of this difference may be that the school we studied was a co-education school and the gender unfriendly school infrastructure may play a big role behind school absenteeism. Therefore it is strongly felt that it should be mandatory for all schools to have separate, private clean toilets for the girl students with running water and proper disposal facility for sanitary pads. More over periodic health checkups with special emphasis on RTI is the need of the hour

The major determinants of good menstrual hygiene have been found to be literacy of the mothers, educational status of the adolescent girls, regular exposure to mass media in the

form of advertisements promoting the use of sanitary pads, prior knowledge regarding menstruation and presence of proper sanitary latrine at home. In a study conducted among adolescent girls in Rajasthan by Khanna *et al.*<sup>9</sup> schooling, residential status, occupation of father, caste and exposure to media were found to be the major predictors of safe menstrual practices among adolescent girls in Rajasthan.

Importantly, this study found a significantly strong relationship between practices during menstruation and prevalence (reported symptoms) of RTIs. Khanna *et al.*<sup>9</sup> also observed the prevalence of RTIs was more than three times higher among girls having poor menstrual hygiene.. These finding are very similar to this study where poor menstrual hygiene was found to have four times higher risk of morbidities related to genitor-urinary tract.

## CONCLUSION

This study reveals that menstrual hygiene is far from satisfactory among a large proportion of the adolescent girls while ignorance, false perceptions, unsafe practices regarding menstruation and reluctance of the mother to educate her child are also quite common among them. Thus, the above findings reinforce the need to encourage safe and hygienic practices among the adolescent girls and bring them out of traditional beliefs, misconceptions and restrictions regarding menstruation

Apart from this, different stakeholders should be involved in developing Information, Education and Communication for promoting positive attitudes towards management of menstruation and related problems among the adolescent girls.

## REFERENCE

1. Menstrual Hygiene: A Neglected Condition for the Achievement of Several Millennium Development Goals. Available at :[http://www.eepa.be/wcm/dmdocuments/BGpaper\\_Menstrual\\_Hygiene.pdf](http://www.eepa.be/wcm/dmdocuments/BGpaper_Menstrual_Hygiene.pdf). Accessed April 4 2012.
2. Caldwell, J., Reddy P.H, et al. The causes of marriage change in South India. *Population Studies* 37.1983; 3: 343-361.
3. Acharya, A., Yadav, K. & Baridalyne, N. Reproductive Tract Infections/ Sexually Transmitted Infections in Rural Haryana: Experiences from the Family Health Awareness Campaign, *Indian Journal of Community Medicine*.2006; Vol. 31:274.

4. Britton, C. Learning about 'The Curse': An Anthropological Perspective on Experiences of Menstruation. *Women's Studies International Forum*.1996; 19: p. 645-653.
5. Tentative Programme Schedule Meeting of the State Health Secretaries and Mission Directors, NRHM:P 36-40. Available at <http://mohfw.nic.in/WriteReadData/1892s/450303850Agenda.pdf>. Accessed April 4 2012.
6. Dasgupta et al. Menstrual Hygiene: How Hygienic is the adolescent girl? *Indian J Community Med* 2008;33:77-80.
7. El-Gilany AH, Badawi K. Menstrual hygiene among adolescent schoolgirls in Mansoura, Egypt. *Reprod Health Matters* 2005;13:147-52.
8. Deo DS, Ghattargi CH. Perceptions and practices regarding menstruation: a comparative study in urban and rural adolescent girls. *Indian J Community Med* .2005;30:33-4.
9. Khanna A, Goyal RS, Bhawsar R. Menstrual practices and reproductive problems: a study of adolescent girls in Rajasthan. *J Health Manag* .2005;7:91-107.

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