Determinants of menstrual hygiene among school going adolescent girls in a rural area of West Bengal

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ABSTRACT

Background: Menstrual hygiene is a neglected issue in rural India. Lack of menstrual hygiene in adolescent girls can make them susceptible to various morbidities, for example, reproductive tract infection and urinary tract infection and their long-term consequences, for example, cervical cancer, infertility, and ectopic pregnancy. This study aims to find out the determinants of menstrual hygiene among the school going adolescent girls in a rural area of West Bengal. Objectives: To elicit the menstrual hygiene practices among the study population and to find out the association of poor menstrual hygiene practices with sociodemographic factors, such as age, occupation and education of the parents, housing, and presence of sanitary toilet. Materials and Methods: A descriptive, cross-sectional study was conducted among 307 school going adolescent girls of 12–17 years age group in a rural area of West Bengal. Results: Majority of the students in both schools (62.9%) were Hindu, general caste (54.1%) and belonged to nuclear family (69.7%). Most of the parents in both schools had completed their education up to primary level. Bivariate analyses were done, and the significant factors predicting good menstrual hygiene were entered into the multivariable logistic regression model. It revealed that good menstrual hygiene was more among those whose mothers were educated (adjusted odds ratios [AOR] 2.3 [1.06–5.01]), and who were homemakers (AOR 2.3 [1.06–5.01]). Conclusions: Menstrual hygiene among the study population was found to be poor. The improving education level of the mothers can go a long way in improving menstrual hygiene practice.

Keywords: Adolescent girls, menstrual hygiene practices, multivariable logistic regression

Introduction

About one-fifth (21.4% or 243 million) of India’s population is constituted by the adolescents who can transform the social and economic fortunes of the country.[]

Adolescence is a period between childhood and adulthood. Girls experience menstruation for the first time during adolescence. Menstruation may be defined as a periodic and cyclical shedding of endometrium accompanied by loss of blood. It takes place at approximately 28-day intervals between the menarche (onset of menstruation) and the menopause (cessation of menstruation).[2] Menstruation is such an issue which is often clouded by various myths and misconceptions in our society. Although it is a normal physiological phenomena, this topic is not discussed openly. The adolescent girls get debarred due to various social misconceptions, low socioeconomic conditions, and lack of proper health education either at home or at school. Moreover, inadequate and inappropriate Water, sanitation and hygiene facilities in schools, especially in rural areas also comes in the way of managing their menstruation healthily, safely, and with dignity. These affect their health and educational attainment. They sometimes even suffer from reproductive and urinary tract infection due to ignorance about proper menstrual hygiene practices.

How to cite this article: Sarkar I, Dobe M, Dasgupta A, Basu R, Shahbabu B. Determinants of menstrual hygiene among school going adolescent girls in a rural area of West Bengal. J Family Med Prim Care 2017;6:583-8.
Adolescent girls are often reluctant to discuss the topic regarding menstruation with their parents and often hesitate to seek medical help regarding menstrual problems. All these can lead to serious complications such as ectopic pregnancy, infertility, and chronic pelvic inflammatory disease.

Many studies have been done in India and abroad focusing on menstrual hygiene, but so far very few studies on this topic have been done in the rural area of West Bengal. For example, studies done in India by Jaiakhani et al[9] in Mirat, Ray S et al[10] in West Bengal and in abroad by El-Gilany A.H[11] in Egypt have tried to find out menstrual hygiene practices and its determinants among the adolescent girls. Many of these determinants are modificable. If these are identified and addressed, it can go a long way in promoting good menstrual hygiene practice among adolescent girls from the very beginning.

With this background, the present study was undertaken among adolescent school-going girls in a rural area of West Bengal with the following objectives:

- To study the sociodemographic profile among the school-going adolescent girls of age group 12–17 years selected from two schools in a rural area of West Bengal
- To find out the menstrual hygiene practices among the study population
- To find out the association between poor menstrual hygiene practices with sociodemographic factors such as - age, class, religion, caste, type of family, education and occupation of parents, housing, and presence of sanitary toilet.

**Materials and Methods**

The study was a school-based cross-sectional study conducted for 2 months (June 2014–August 2014). The study was conducted in two Government Higher Secondary Girls’ Schools selected purposively in Chinsurah-Mogra Block of Hooghly District which is situated in a rural area of West Bengal.

From the school lists and information gathered from D. I. office of Hooghly district, two schools fulfilling the predetermined criteria were shortlisted:

- Girls’ school
- Government Higher Secondary Schools situated in a rural area
- Students were mainly coming from nearby rural area.

The first school selected was Shyama Prasad Vidyalaya for Girls’ (High). It is a government sponsored Higher Secondary Bengali Medium Girls’ School. The second school chosen was Saradamoni Balika Vidyalaya. It was also a government sponsored Higher Secondary Bengali Medium Girls’ school.

All the students of Classes VII-IX and age group of 12–17 years attending the two schools during the study period were considered as the study population.

**Inclusion criteria**

- Those students who had attained menarche at the beginning of the study had been assessed for practice regarding menstrual hygiene.

**Exclusion criteria**

- Students not willing to take part in the study were excluded from the study
- Students who were seriously ill were excluded from the study.

**Study tools**

**Pretested questionnaire**

The questionnaire was prepared in such a way that it conformed with the objectives of the study.

The questionnaire had three sections:

- Section A: Consisted of questions related to sociodemographic characteristics
- Section B: Consisted of questions related to perception regarding menstruation
- Section C: Comprised of questions on practice of menstrual hygiene and restrictions practiced during menstruation.

The questionnaire was first prepared in English. Then, it was translated into Bengali by an expert in that language keeping semantic equivalence. To check the translation, it was back translated into English by two independent researchers who were unaware of the first English version.

Face validity of each item and content validity of each domain had been checked by the experts of All India Institute of Hygiene and Public Health, Kolkata. All efforts were made to keep the questions simple and unambiguous according to the objectives of the study.

**Pretesting of the questionnaire**

Pretesting of the questionnaire was done to see the clarity, absence of ambiguity, objectivity, and simplicity in another school selected purposively from the schools enlisted as per study criteria. Bansberia Girls’ High School was chosen for this purpose. This school selected for pretesting of the questionnaire was a different school but fulfilled the same criteria used for selection of the study schools.

The questionnaire had been pretested among 12 students. Average time taken for each respondent was also calculated for feasibility of the study. Necessary corrections and modifications were made accordingly.

**Method of data collection**

**Selection of the schools**

The schools were selected as described before. The permission for conducting a study in schools was taken from Head Teacher and School Committee of both the schools after due explanation of cause, methods, and implication of the study. Permission of class teachers was taken explaining to them how the study was to be conducted.
Obtaining the ethical clearance
The protocol was cleared by the Institutional Ethics Committee and was later approved by the West Bengal University of Health Sciences.

Preparation of list of the students
A list of students of both the schools was obtained from school records.

Recording of information was done regarding sociodemographic characteristics, perception regarding menstruation, menstrual hygiene practices, and restrictions practiced during menstruation by administering the questionnaire. The questionnaire was provided to those students who had achieved their menarche at the beginning of the study. Care was taken that no consultations were made with the fellow students by strict vigilance with the help of school teachers.

Ethical issues
All principles regarding ethical issues, i.e., principle of confidentiality, autonomy, consent, beneficence, nonmalaficience, and justice were maintained in this study.

Limitations of the study
Two schools were selected purposively. Recall bias or conscious falsification on the part of the students regarding sociodemographic profile or practice of menstrual hygiene could also have affected the results of the study.

Statistical analysis
Data were analyzed in SPSS (version 20, IBM, Kolkata, West Bengal). Continuous variables were presented as median and interquartile range and categorical data were presented based on frequency and percentage. Multivariable logistic regression had been done to find out the strength of association between dependent variable and independent variables. First, a univariate regression was done to ascertain the relationship of the dependent variable with other independent variables. Only those found to be significant were entered into the multiple logistic regression model. Scoring was done for menstrual hygiene practice. Range of score was 9-68. More than median of the attained score was considered good. [Table 1]. For the entire statistical test applied \( P < 0.05 \) had been considered to reject null hypothesis.

Results
Majority of the students of both the schools (62.9%) were Hindu. Majority of the parents of the students in both schools had

| Table 1: Scoring adapted for analysis of research work |
| Variable                                      | Number of items | Range of attainable scores | Categorization used in regression |
|-----------------------------------------------|-----------------|----------------------------|-----------------------------------|
| Menstrual hygiene practice                    | 9               | 9-68                       | Good: More than median of attained score |
|                                               |                 |                            | Poor: Less than or equal to the median of the attained score |

| Table 2: Sociodemographic profile of the study population (n=307) |
|---------------------------------------------------------------|
| Variable                                      | n (%)          |
| Class of schooling                                      |                |
| Class VII                                                 | 96 (31.3)      |
| Class VIII                                                | 106 (34.5)     |
| Class IX                                                  | 105 (34.2)     |
| Age (in completed years)                                 |                |
| 12                                                         | 45 (14.7)      |
| 13                                                         | 61 (19.9)      |
| 14                                                         | 118 (38.4)     |
| 15                                                         | 52 (16.9)      |
| 16                                                         | 17 (5.5)       |
| 17                                                         | 14 (4.6)       |
| Religion                                                  |                |
| Hindu                                                      | 193 (62.9)     |
| Muslim                                                     | 25 (8.1)       |
| Christian                                                  | 89 (29.0)      |
| Type of family                                            |                |
| Nuclear                                                    | 214 (69.7)     |
| Joint                                                      | 93 (30.3)      |
| Education level of mother                                 |                |
| No formal education                                       | 23 (7.5)       |
| Below primary                                             | 36 (11.7)      |
| Primary                                                   | 141 (45.9)     |
| Middle                                                    | 33 (10.7)      |
| Secondary                                                 | 63 (20.5)      |
| Higher secondary                                          | 9 (3.0)        |
| Graduate and above                                        | 2 (0.6)        |
| Education level of father                                 |                |
| No formal education                                       | 8 (2.6)        |
| Below primary                                             | 30 (9.8)       |
| Primary                                                   | 69 (22.5)      |
| Middle                                                    | 109 (35.5)     |
| Secondary                                                 | 54 (17.6)      |
| Higher secondary                                          | 34 (11.1)      |
| Graduate and above                                        | 3 (0.9)        |
| Occupation of mother                                      |                |
| Homemaker                                                 | 221 (71.9)     |
| Unskilled labor                                           | 13 (4.2)       |
| Semi-skilled labor                                        | 13 (4.2)       |
| Skilled labor                                             | 14 (4.6)       |
| Clerical/shop-owner                                       | 33 (10.7)      |
| Semi-professional                                         | 13 (4.2)       |
| Occupation of father                                      |                |
| Unemployed                                                | 3 (0.9)        |
| Unskilled labor                                           | 29 (9.4)       |
| Semi-skilled labor                                        | 55 (17.9)      |
| Skilled labor                                             | 53 (17.3)      |
| Clerical/shop-owner                                       | 138 (44.9)     |
| Semi-professional                                         | 11 (3.6)       |
| Professional                                              | 18 (5.9)       |
| Housing                                                    |                |
| Pucca                                                      | 79 (25.7)      |
| Semi-pucca                                                 | 133 (43.3)     |
| Kutchha                                                    | 95 (30.9)      |
| Sanitary toilet in house                                  |                |
| Present                                                    | 195 (63.5)     |
| Absent                                                     | 112 (36.5)     |


completed their education up to primary level (father - 65.1% and mothers - 30%) [Table 2].

In both school, the majority of the respondents (50.2%) said that the primary source of information regarding menstruation was their mother. Majority of the students knew that menstruation was a normal physiological process (97.0%). Only 28.3% had a correct knowledge that the source of menstrual blood is uterus [Table 3].

60.6% of the study population restricted sour foods, 86.3% restricted religious activities, 63.5% restricted shampooing hair, and 6.19% restricted wearing washed clean clothes [Table 4].

In both schools, the majority of the study population (47.9%) use both sanitary napkin and cloth. 20.8% use only sanitary napkins whereas 31.3% use only cloth. Those who were using cloth majority of them were reutilizing it (74.1%). Majority of the study population dispose the menstrual absorbent in vat (42.3%) [Table 5].

The variables which were found to be significant in binary logistic regression were age, religion, caste, education of parents, and occupation of mother. The variables which remained significant in the multivariable analysis were education level and occupation of the mother. The strength of association of these variables was attenuated when controlling for the other variables in the multivariate analysis [Table 6].

Discussion

The present study showed that the mother of the adolescent girl was the primary source of information regarding menstruation, for majority of the respondents.

Similar studies done by Damor and Kantharia,[5] Jailkhani,[1] Jogdand and Yerpude[6] in urban settings in Meeraj and Guntur found that the main source of information regarding menstruation was mother. Ray S, Dasgupta A,[3] in rural secondary school of West Bengal the main source of knowledge being mother and sister (45%). These findings are consistent with the present study. Whereas Yasmin et al[7] reported that in most cases their first informant was their friend. Juyal et al[8] in Uttarakhand reported that friends were the first informant in about 31.8 % girls.

Table 3: Perception regarding menstruation among the study population (n=307)

| Variable                                      | Frequency (%) |
|-----------------------------------------------|---------------|
| Primary source of information regarding menstruation |               |
| Mother                                        | 154 (50.2)    |
| Sister                                        | 73 (23.8)     |
| Friend                                        | 71 (23.1)     |
| Relatives                                     | 3 (1.0)       |
| Teacher                                       | 6 (1.9)       |
| Menstruation is                               |               |
| Normal physiological phenomena                | 298 (97.0)    |
| Disease                                       | 9 (3.0)       |
| Organ from which menstrual blood comes        |               |
| Stomach                                       | 45 (14.6)     |
| Uterus                                        | 87 (28.3)     |
| Urinary tract                                 | 174 (56.7)    |
| Ovary                                         | 1 (0.3)       |

Table 4: Restrictions practiced during menstruation among the study population (n=307)

| Restrictions                              | Frequency (%) |
|-------------------------------------------|---------------|
| Restrict sour foods                       | 186 (60.6)    |
| Restrict religious activities             | 265 (86.3)    |
| Restrict shampooing hair                  | 195 (63.5)    |
| Restrict wearing washed clean clothes     | 19 (61.9)     |

Table 5: Baseline menstrual hygiene practices among study population (n=307)

| Variables                                      | Frequency (%) |
|-----------------------------------------------|---------------|
| Type of absorbent (n=307)                     |               |
| Only sanitary napkin                          | 64 (20.8)     |
| Both sanitary napkin and clothes              | 147 (47.9)    |
| Only clothes                                  | 96 (31.3)     |
| Absorbent change times (n=307)                |               |
| ≥ 4 times                                     | 130 (42.3)    |
| < 4 times                                     | 177 (57.6)    |
| Cleaning of genitalia during last menstrual cycle (n=307) | |
| ≥ 4 times                                     | 160 (52.1)    |
| < 4 times                                     | 147 (47.9)    |
| Material used for genitalia cleaning (n=307)  |               |
| Soap and water                               | 194 (63.2)    |
| Only water                                    | 113 (36.8)    |
| Reutilize the cloth (n=243)                   |               |
| Yes                                           | 180 (74.1)    |
| No                                            | 63 (25.9)     |
| Place for washing reutilizable clothes (n=180) |          |
| Pond water                                    | 53 (29.4)     |
| Tap water                                     | 82 (45.6)     |
| Both pond and tap water                      | 45 (23.0)     |
| Use soap for washing clothes (n=180)          |               |
| Yes                                           | 166 (92.2)    |
| No                                            | 14 (7.8)      |
| Dry the reutilizable clothes in sunlight (n=180) |          |
| Yes                                           | 50 (27.8)     |
| No                                            | 130 (72.2)    |
| Dispose menstrual absorbent (n=307)           |               |
| Dispose indiscriminately                      | 52 (16.9)     |
| Dispose in a vat                              | 130 (42.3)    |
| Dispose in latrine                            | 39 (12.7)     |
| Dispose in ground                             | 27 (8.8)      |
| Dispose in a dustbin                          | 59 (19.2)     |
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In the present study, majority of the students knew that menstruation was a normal physiological process. Kamath et al.[9] in Udupi taluk reported that 72.2% (n = 195) of urban and 68.9% (n = 193) of rural adolescent girls knew that menstruation was a physiologic process. Yasmin et al.[7] found that 72.8% of respondents knew menstruation to be a physiological process. This finding is consistent with the present study.

The present study showed that in the majority of the respondents knew that the source of menstrual blood is urinary tract. Only 28.3% of the study population had a correct knowledge about source of menstrual blood which was uterus.

A study done by Singh A, Bhandari A et al.[10] at villages of khirsu block of Gharwal found that 32% girls reported uterus as the organ from which the menstrual blood comes. Almost similar type of findings was elicited by Kamath et al.[9] in a study done in Udupi taluk. These findings are consistent with the present study. Another study done in a rural area of West Bengal by Yasmin et al.[10] elicited that 63.3% of the respondents knew bleeding occurs from the uterus. These findings are not consistent with the present study. The study has been done in higher age group which may be the reason for the greater percentage of the girls correctly knowing the source of menstrual blood.

In the present study, the percentage of the students restricting religious activities was much more. The difference in study settings may be the cause. Another study done by Ray et al.[3] in a rural area in West Bengal elicited that restricting sour food and not visiting temple have been the most common restrictions observed by the girls. This finding is more or less consistent with the present study.

In the present study, in both schools, majority of the study population use both sanitary napkin and cloth. A study done by Damor and Kantharia[5] among adolescent school girls in an urban setting elicited that 52.34% used only sanitary napkins as menstrual absorbent while 44.53% used both cloth and pad. This finding is consistent with the present study. Another study done by Singh et al.[10] at the villages of Khirsu block of Gharwal elicited that only 38% girls used sanitary pads during menstruation and 63.7% girls dried their clothes in the corner of the house.

However, Yasmin et al.[7] in an institution-based study under the urban field practice area of Medical College Kolkata reported that 82.3% of the adolescent girls used sanitary pads only, and 15.7% of the respondents used old washed cloth. This finding is different from the present study. Different study setting may be the cause. Jogdand and Yerpude[8] in a community-based cross-sectional study in an urban slum area found that 78.99% girls were restricted to attend religious occasions during menstruation.

| Table 6: Association between baseline practice score and sociodemographic characteristics of study population (n=307) |
| Variables | Good practice (>23 i.e., median), n (%) | OR (CI) | AOR (CI) |
| Class | | | |
| IX | 58 (55.2) | 1.59 (0.99-2.57) | - |
| VII and VIII | 88 (43.6) | 1 | |
| Age (continuous) | | | |
| Religion | | | |
| Hindu | 103 (53.4) | 1.89 (1.18-3.03) | 1.36 (0.8-2.32) |
| Muslim and Christian | 43 (57.7) | 1 | |
| Caste | | | |
| General | 92 (55.4) | 2.00 (1.27-3.16) | 1.26 (0.54-1.69) |
| SC, ST and OBC | 54 (38.3) | 1 | |
| Type of family | | | |
| Nuclear | 107 (50.0) | 1.38 (0.85-2.26) | - |
| Joint | 39 (41.9) | 1 | |
| Education level of mother | | | |
| ≥ Secondary | 51 (68.9) | 3.22 (1.85-5.62) | 2.67 (1.36-5.23) |
| < Secondary | 95 (40.8) | 1 | 1 |
| Education level of father | | | |
| ≥ Secondary | 55 (60.4) | 2.09 (1.27-3.46) | 1.24 (0.67-2.30) |
| < Secondary | 91 (42.1) | 1 | 1 |
| Occupation of mother | | | |
| Homemaker | 121 (54.8) | 2.95 (1.73-5.05) | 2.53 (1.42-4.50) |
| Others | 25 (29.1) | 1 | |
| Housing | | | |
| Pucca | 43 (54.4) | 1.45 (0.87-2.42) | - |
| Kutch, semi-pucca | 103 (45.2) | 1 | |

For the multivariate model, the Hosmer-Lemeshow test gave P=0.098, (not significant) indicating good model fit. Nagelkerke R²=0.297 showing that the variables included in the model predicted 29.7% of good practice. CI: Confidence interval; OR: Odds ratio; AOR: Adjusted odds ratio.
of adolescents was found with different absorbent materials used during menstruation and reuse of cloth after washing at \( P < 0.05 \). This finding is consistent with the present study.

**Conclusion**

Menstrual hygiene among the study population was found to be poor. Improving education level of the mothers can go a long way in improving menstrual hygiene practice.

Adolescent girls in rural area are the most deprived and underprivileged. They are also at risk of having incorrect and inadequate perceptions and unhealthy practices. Adolescence being the major receptive period, if appropriate, adequate health education is given then these adolescent girls at this tender age will remain as healthy as their richer counterparts. Since they will practice healthy behavior, they will also generate the correct message when they have their own family. In this way, there will be a successful implementation of correct habit, culture, practice regarding menstruation and menstrual hygiene at individual, family, and community level for years to come.

**Acknowledgment**

We acknowledge all the participants, their parents, and school teachers for cooperation in this study.

**Financial support and sponsorship**

Nil.

**Conflicts of interest**

There are no conflicts of interest.

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