

Knowledge and Practice on Menstrual Hygiene among Girl Students in Saharsa District of BiharSukriti Kumari¹, Srishti²¹Senior Resident, Department of Obstetrics & Gynecology, Shree Narayana Medical Institute & Hospital, Saharsa, Bihar, India.²Assistant Professor, Department of Obstetrics & Gynecology, Netaji Subhas Medical College & Hospital, Bihta, Patna, Bihar, India.

Received: 25-11-2023 / Revised: 23-12-2023 / Accepted: 27-01-2024

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Conflict of interest: Nil

Abstract:**Objectives:** The present study was to evaluate the knowledge and practice on menstrual hygiene and also evaluate the various barrier of menstrual hygiene among school going girl students.**Methods:** Data was collected using a predesigned and pretested structured questionnaire to study their level of awareness regarding menstruation. The data collection tool contained four domains: sociodemographic profile consisted of personal and menarche-related characteristics, the knowledge domain included questions on the physiology of menstruation like origination of blood, frequency, and duration of the menstrual period, the flow of the cycle, awareness of menopause and knowledge on irregular cycles, etc. Practices aspect included questions like the type of absorbent; wash and dry used clothes; frequency of changing pads in schools and in their homes, cleaning of external genitalia, and various restrictions during menstruation.**Results:** A total of 500 school going girl students with age 13 to 19 years were enrolled. Mean age of menarche was 12.21±1.32 years. 68(13.6%), 46(9.2%) was excess and scanty blood flow during menses respectively. Irregular menses was seen in 108(21.6%) girls. Most of the girls 164(32.8%) were belonged in socioeconomic status II. 74(14.8%) girls had duration of flow 7 or beyond 7 days. 298(59.6%) girls were aware regarding menarche prior to menstruation. Dysmenorrhea was seen in 394(78.8%) girls. 384(76.8%) girls were not visited holy places or attending religious functions during menses. 169(33.8%) school going girls were not using sanitary pad due to 87(17.4%) expensive, 45(9%) difficult/embarrassing, 24(4.8%) feels uncomfortable and 13(2.6%) any others region.**Conclusions:** Majority of girls are still subjected to various restrictions or barrier during menses. Girls hesitate when discussing sensitive topics like menstrual hygiene, it is important to create a healthy environment where everyone can talk honestly about their personal experiences with this type of delicate subject. Education of girls pertaining to the basic knowledge of menstruation and hygienic practices should be more emphasized in the school curriculum. It is imperative to bring them out of age-old traditional beliefs, taboos, misconceptions, and restrictions and equip them with lifelong skills regarding safe and hygienic practices. Teachers should be trained about menstrual health to empower them to transfer correct scientific information to girls through focused group discussions and other Information Education Communication (IEC) mediums in school, facilitate peer education and engage parents, especially mothers, during parent-teacher meetings to raise menstrual-related awareness. Medical check-up camp should be organized time to time in Government as wells as private school for awareness and screening of menstruation related problem, knowledge and practice for menstruation hygiene.**Keywords:** Menstrual hygiene, Knowledge and Practice, BarriersThis is an Open Access article that uses a funding model which does not charge readers or their institutions for access and distributed under the terms of the Creative Commons Attribution License (<http://creativecommons.org/licenses/by/4.0>) and the Budapest Open Access Initiative (<http://www.budapestopenaccessinitiative.org/read>), which permit unrestricted use, distribution, and reproduction in any medium, provided original work is properly credited.**Introduction**

The first menstruation known as menarche is one of the several signs of puberty accompanied with biological, physical, social and psychological changes. It is common to find adolescent girls, especially from rural schools remaining absent from a week up to a month, owing to menstruation [1]. Most girls in rural schools remain absent because there is no option of “changing” while in school. It is impossible for a girl to remain in school for long

hours during her menstrual period without changing. Often, parents themselves do not know how to handle the physical and emotional development of their adolescent girls, particularly menstruation. As a result, often after a girl gets her menstruation, she is forced to stay at home and miss school. In many cases, parents stop sending their girls to school [1]. Since girls are not properly educated about menstruation, it ends up causing fear, confusion, and

anxiety. Unhygienic practices during menstruation can also cause infections. It is therefore important to create awareness on menstrual hygiene to adolescent girls [1]. Adolescence is a unique time in a woman's life that represents the shift from youth to adulthood. Menstruation is an essential phenomenon in an adolescent girl's life. She undergoes various physiological and psychological changes during this phase of life. Menstruation is considered unclean in India, and teenage girls are not allowed to undertake home chores or engage in religious or cultural events during their period [2]. The problem of improper menstrual hygiene is scarcely acknowledged in developing countries like India. Lack of menstrual hygiene is connected with negative effects such as infections of the reproductive and urinary tract, which may lead to future infertility and birth complications [3]. Proper knowledge about menstrual hygiene and its application can improve adolescent girls' reproductive health to a great extent [3].

Various studies have revealed that most adolescent girls have incomplete and inaccurate information about menstrual physiology and hygiene [4]. In a systematic review of 138 studies in India from 2000 to 2015, involving 193 subpopulations and 97,070 girls, Ejik et al. (2016) reported that half of Indian adolescent girls were unaware of the cause of menstruation while only a quarter had an understanding of the source of bleeding [5]. According to NFHS-5 (2019-2020) data, only 58.8% of women aged 15-24 years in Bihar used hygienic methods of protection during their menstrual period [6].

The mean age at menarche varies from population to population and is known to be a sensitive indicator of various characteristics of population including nutritional status, geographical location, environmental conditions and magnitude of socio-economic inequalities in a society [7,8]. For most females, it occurs between the age of 10 and 16 years; however, it shows a remarkable range of variation. In low-income settings it occurs between the ages of 8 and 16 years with a median age of around 13 years [9,10]. Objectives of our study was to evaluate the knowledge and practice on Menstrual hygiene and also evaluate the various barrier of menstrual hygiene among school going girl students.

Material & Methods

The presents study was conducted in the Department of Obstetrics and Gynecology, Shree Narayana Medical Institute and Hospital, Saharsa, Bihar during a period from January 2023 to July 2023. Attendants of entire subject signed an informed consent approved by the institutional ethical committee of Shree Narayana Medical Institute and Hospital, Saharsa was sought.

Study Settings: Five schools were selected for data collection in Saharsa district of Bihar.

Study Population and Sample Size: The participants who were selected for the collection of data were female students from 7th to 12th standard who had reached the age of menarche (the age limit was 13 to 18 years), who were willing to participate in the study. 500 girls were selected by using random sampling methods.

Inclusion Criteria: School-going girls between age 12 to 19 years who were willing to participate in the study.

Exclusion Criteria: 1. Girls who had not attained menarche. 2. Those girls who were not willing to participate or whose parents did not give consent for their children to participate. 3. Those who were found absent on study days.

Methods

Data was collected using a predesigned and pretested structured questionnaire to study their level of awareness regarding menstruation. The questionnaire was initially prepared in English; translated into the vernacular (Hindi) language then back-translated into English to check consistency. Face validity of the questionnaire was carried out.

The data collection tool contained four domains: sociodemographic profile consisted of personal and menarche-related characteristics, the knowledge domain included questions on the physiology of menstruation like origination of blood, frequency, and duration of the menstrual period, the flow of the cycle, awareness of menopause and knowledge on irregular cycles, etc. Practices aspect included questions like the type of absorbent; wash and dry used clothes; frequency of changing pads in schools and in their homes, cleaning of external genitalia, and various restrictions during menstruation. The time required for each interview was around 20-30 minutes. After collecting data, any queries of students regarding menstrual hygiene were solved.

Statistical Analysis: Data was analysed by using latest version of SPSS software. All data was tabulated and percentages were calculated. Mean and standard deviation were observed.

Observations: A total of 500 school going girl students with age 13 to 19 years were enrolled in the present study. Most of the girls were in age group of 12 to 15 years. Mean age of girls was 14.24 ± 1.98 years. Most of the girls 412(82.4%) were belonged in Hindu religion. Muslims were 80(16%) and others 8(1.6%). 310(62%) girls were studied on standard 6-8 and 190(38%) were studied on >9 standard. Most of girls 352(70.4%) family were nuclear type. 442(88.4%) girls had sanitary toilet at home. Most of the girl's father was skilled worker 201(40.2%), 54(10.8%), 145(29%) and 100(20%)

fathers was unskilled worker, self-employed and service man. 62(12.4%), 290(58%) and 148(29.6%) girl's father education was illiterate, <Secondary and >secondary respectively. Education of most of the girl's mother 322(64.4%) was < secondary. 148(29.6%) mothers were >Secondary education.

And 62(12.4%) was illiterate. Most of the girls 164 (32.8%) were belonged in socioeconomic status II. 142(28.4%) were belonged in socioeconomic status I. 116(23.2%) girls were belonged in socioeconomic status III.

Table 1: Sociodemographic profile of school going girls (N=500)

Age group (Years)	Frequency
12-15	344(68.8%)
16-19	156(31.2%)
Mean \pm S.D	14.24 \pm 1.98 years
Religion	
Hindu	412(82.4%)
Muslim	80(16%)
Others	8(1.6%)
Standard/Class	
6-8	310(62%)
>9	190(38%)
Type of family	
Nuclear	352(70.4%)
Joint	148(29.6%)
Sanitary toilet at home	
Present	442(88.4%)
Absent	58(11.6%)
Occupation of father	
Unskilled worker	54(10.8%)
Skilled worker	201(40.2%)
Self employed	145(29%)
Service	100(20%)
Education of father	
Illiterate	62(12.4%)
<Secondary	290(58%)
>Secondary	148(29.6%)
Education of mother	
Illiterate	102(20.4%)
<Secondary	322(64.4%)
>Secondary	76(15.2%)
Socioeconomic strata	
I	142(28.4%)
II	164(32.8%)
III	116(23.2%)
IV	44(8.8%)
V	34(6.8%)

Menarche age of most of the girls 383(76.6%) was 13-15 years. Mean age of menarche was 12.21 \pm 1.32 years. Amount of flow of blood during menses in most of the girls 386(77.2%) was normal. 68(13.6%), 46(9.2%) was excess and scanty blood flow during menses respectively. Regular menses was seen in 392(78.4%) girls. Irregular was seen in 108(21.6%) girls. Duration of flow in most of the

girls was 4-6 days. 74(14.8%) had 7 or beyond 7 days flow. 54(10.8%) girls had 1-3 days duration of flow. 298(59.6%) girls were aware regarding menarche prior to menstruation. 202(40.4%) girls were not aware. 402(80.4%) girls had not any others menstruation problems. Dysmenorrhea was seen in 394(78.8%).

Table.2. Showing the pattern of menstruations (N=500).

Pattern	Frequency
Age at menarche (years)	
10-12	72(14.4%)
13-15	383(76.6%)
>15	45(9%)
Mean \pm S.D.	12.21 \pm 1.32
Amount of flow	
Normal	386(77.2%)
Scanty	46(9.2%)
Excess	68(13.6%)
Regularity of menses	
Regular	392(78.4%)
Irregular	108(21.6%)
Duration of flow (days)	
1-3	54(10.8%)
4-6	372(74.4%)
7 or beyond 7 days	74(14.8%)
Awareness regarding menarche prior to menstruation	
Yes	298(59.6%)
No	202(40.4%)
Any other menstrual problems	
Yes	98(19.6%)
No	402(80.4%)
Dysmenorrhea	
Present	394(78.8%)
Absent	106(21.2%)

In the present study, 467(93.4%) girls were known about menstruation is a natural phenomenon. 484(96.8%) were known regarding duration of flow upto 7 days. 476(95.2%) were known about the menstrual blood is impure. 478(95.6%) girls were aware regarding menopause. 423(84.6%) girls were

known regarding menstruation is an indication of fertility. 387(77.4%) girls were known about the influence of hot and cold food on menses. Only 278(55.6%) girls known about excessive bleeding leads to anemia.

Table.3. Knowledge of school going girls on menstruation.

Knowledge	Frequency
Reason for menstruation (Hormones/Age)	311(62.2%)
Menstruation is a natural phenomenon (Yes)	467(93.4%)
Origin of menstrual blood (Uterus)	343(68.6%)
Menstrual blood is impure (Yes)	476(95.2%)
Frequency of menstrual cycle (Monthly)	453(90.6%)
Awareness regarding menopause (Yes)	478(95.6%)
Menstruation is an indication of fertility (Yes)	423(84.6%)
Normal duration of menses (upto 7 days)	484(96.8%)
Influence of hot and cold food on menses (Yes)	387(77.4%)
Excessive bleeding leads to anemia (Yes)	278(55.6%)

In the present study, 384(76.8%) girls were not visited holy places or attending religious functions during menses. 220(44%) girls were discontinued physical activities/games/playing outdoors.

Table. 4. Restriction practice during menstruation.

Restrictions	No. of girls
Discontinuing physical activities/games/playing outdoors	220(44%)
Not visiting holy places or attending religious functions	384(76.8%)
Diet restrictions	243(48.6%)
Restricting kitchen work	92(18.4%)
Isolation or sleeping separately	36(7.2%)

Missing school	144(28.8%)
Reasons for missing school	
Pain	103(20.6%)
Fear of leakage/staining of clothes	18(3.6%)
No place to change or dispose of pads	8(1.6%)
Feel uncomfortable	15(3%)

In the present study, 169(33.8%) school going girls were not using sanitary pad due to 87(17.4%) expensive, 45(9%) difficult/embarrassing, 24(4.8%) feels uncomfortable and 13(2.6%) any others region. Frequency of changing sanitary pad/cloth in a day of 296(59.2%) girls had 2-3 times.

Table.5. Menstrual hygiene practices (N=500).

Hygiene practice	Response	No. of girls
Reason for not using pads (using only cloth or both)	Expensive	87(17.4%)
	Difficult/embarrassing	55(11%)
	Feels uncomfortable	24(4.8%)
	Any others	13(2.6%)
	Total	179(35.8%)
Absorbents used during menses	Only Cloth	69(13.8%)
	Sanitary pad	321(64.2%)
	Both	110(22%)
Frequency of changing sanitary pad/cloth in a day	2-3 times	296(59.2%)
	>3 times	44(8.8%)
	Once	7(1.4%)
Method of disposal of absorbent	Wash & Reuse	2(0.4%)
	Throwing in dustbin	354(70.8%)
	Open dumping	104(20.8%)
	Flush out in the toilet	2(0.4%)
Wrapping the pad while disposing	Yes	322(64.4%)
	No	38(7.6%)
Washing hands with soap after changing sanitary napkin/cloth	Yes	495(99%)
	No	5(1%)
Taking bath daily	Yes	424(84.8%)
	No	76(15.2%)
Agents used for cleaning	Soap and water	376(75.2%)
	Plain water	124(24.8%)
Washing genital area while changing pads/cloth	Yes	446(89.2%)
	No	54(10.8%)
Frequency of cleaning the genitals during menstruation	<2 times	278(55.6%)
	>2 times	222(44.4%)
Sundrying undergarments	Yes	464(92.8%)
	No	36(7.2%)

Discussions

Menstrual hygiene is a critical issue encountered by women and girls of reproductive age that negatively affects their health and empowerment [11]. Girls in developing countries encounter problems in managing menstruation properly because they lack the basic facilities of WASH (water, sanitation, and hygiene), proper information, a suitable environment, and support, which ultimately, affects their basic human rights to education, health, and privacy [12]. This is due to a lack of knowledge, improper awareness, and poor attitudes and practices towards menstruation and menstrual hygiene [13].

In the present study, most of the girls were in age group of 12 to 15 years. Mean age of girls was 14.24 ± 1.98 years. Mean age of menarche in our study was 12.21 ± 1.32 years. Menarche age of most of the girls 383(76.6%) was 13-15 years, which is comparatively lesser than a previous study [14] that had reported the average age of menarche as 13.16 ± 1.9 years, while a more recent study (2020) in Haryana reported it to be 12.8 ± 1.73 years [15]. This shows a declining trend in the average age of menarche influenced perhaps by factors such as geographical location, education, wealth status, caste, religious affiliations, etc.

In the present study, 298(59.6%) of the adolescent girls had awareness about menstruation before

menarche, which is similar to the study conducted in West Bengal, where 67.5%, and in Uttarakhand, where 62.5% of girls were aware of menstruation prior to attainment of menarche [16,17]. However, it was observed to be low, around 24%, in the study conducted by Deshpande et al. [18] and only 18.67% in the study by Zaidi et al. [19] Sociodemographic variations between study populations may contribute to this difference.

In the present study, education of most of the mothers 322(64.4%) were < secondary. 148(29.6%) mothers were >Secondary education. Similar findings were observed in studies by Patel et al. [20] and Ramachandra et al. [21] where the mother was the primary source of this information in 64.5% and 85% of girls, respectively. So, a mother plays a significant role in imparting knowledge and preparing a girl for menstruation, and this should be openly discussed before they reach menarche to prevent related morbidities in the future.

Regarding the knowledge of school going girls, the majority, 94.3%, correctly knew that menstruation is a normal physiological phenomenon. The results of the present study were congruent to other studies conducted by Patel et al. in Gujarat (80.42%) [15] and Sarkar et al. in West Bengal (97%) [22].

In the present study, 343(68.6%) knew that the source of blood was the uterus, which is consistent with the finding of Surana et al.[15] which elicited that 59.9% of girls had this knowledge, whereas studies by Deshpande et al. and Sarkar et al. showed that only 16% and 28.3% of the study respondents had a correct knowledge that the source of menstrual blood is from the uterus [18,22]. The above observation might be due to the poor literacy level of mothers or the absence of health education programs in schools focusing on menstrual hygiene.

In the present study, sanitary pad was the most frequently used 356(71.2%) absorbent during menses, followed by both pads and cloth in 110(22%), which is comparable to other studies across different parts of India like the study by Sajjan et al. in Karnataka which demonstrated that 78% of girls used only sanitary pads [24] and another similar study from Gujarat [20] showed that majority 55% of girls used commercial pads. However, few studies also revealed a relatively lower usage of sanitary pads [22,25]. This might be due to the advancement in time and different study settings. The reasons cited behind the less or non-usage of pads in our study included difficulty or embarrassment faced by adolescents to procure or buy sanitary pads 55(11%), followed by the high cost of commercial pads in 87(17.4%) of cases which is similar to the study from South India where 68% of girls found the pads to be expensive [24]. The cost factor thus acts as an impediment, and girls have to resort to usage and reuse of cloth during

menstruation, particularly in rural settings leading to an increased risk of reproductive tract infections. Although the Department of Health has initiated social marketing to make sanitary napkins available at affordable prices, but it still needs proper advocacy and thorough marketing.

The present study observed that about 296(59.2%) of girls changed the absorbents two to three times a day which is in concordance with several studies [19,14,24,26]. Method of disposal of sanitary pads was satisfactory (throwing in dustbins after wrapping it) among 354 (70.8%) of the girls. Similar findings were obtained in other studies as well [20,26].

222(44.6%) of girls in the present study washed their genitals frequently >2 times. 278(55.6%) girls were washed genitalia < 2 times. Which is the same (35%) as a study by Parikh et al. [26] Only one-fifth (21%) of girls used soap and water for cleansing their genital area as against 97.5% in the study by Dasgupta et al. [16] and 77.5% in another study conducted in Bihar [27]. These differences in practices could be attributed to the fact that some of the school students are being taught the basics of menstrual hygienic practices as a part of their curriculum.

In the present study, 202(40.4%) girls in our study have poor knowledge regarding menstruation which is better than a similar study conducted in Ethiopia, where 68.3% had poor knowledge and perception of menstrual hygiene [28]. The possible explanation for this could be the varied measurement techniques used to assess the level of knowledge as well as the sociocultural differences of study participants.

179(35.8%) of girls practiced poor menstrual hygiene, which is in line with the studies conducted by Surana et al. in rural Haryana and Sarkar et al. in rural areas of West Bengal, where 43.6% (283 out of 649) and 52.4% (161 out of 307) adolescent girls were reported to have poor menstrual hygiene respectively [15,22]. However, slightly better results were obtained in the neighbouring country, Nepal, where only one-third (33%) of girls had poor menstrual hygiene practices [29]. This disparity might be again due to different study settings and divergent scoring systems for measuring the practice levels of menstrual hygiene.

The important determinants of good menstrual hygiene practice among adolescent girls in the current study included higher literacy levels of their father as well as mother, those studying in private schools, having better socioeconomic status, girls living in joint families, presence of sanitary toilet at home and prior awareness regarding menstruation. Similarly, variables like educational status of the parents, prior knowledge regarding menstruation and presence of proper sanitary toilet at home were found to be significantly associated with menstrual

hygiene practices in other studies [22,30]. On multivariate analysis, the type of school and type of family were found to be major predictors of menstrual hygiene practices in our study. Girls studying in private schools had better hygienic practices than their counterparts which is consistent to studies by Asati et al. in Madhya Pradesh and Sharma et al. in Rajasthan [31,32]. This significant difference may be due to the type of curriculum and the knowledge imparted by the teachers in their respective schools because knowledge given by teachers regarding menstrual hygiene ultimately affects the menstrual practices of pupils. Interestingly, adolescent girls residing in joint families were observed to have better menstrual hygiene practices probably because the girls can freely discuss about menstruation and related aspects owing to a greater number of females in joint families; thus, they might be better informed or guided compared to those who lived in nuclear or smaller families. This is however, in contrast to other studies [15,22] where joint families showed a higher association with the odds of practicing poor menstrual hygiene. This might arise due to socio-cultural differences between the study populations.

Numerous restrictions were imposed on the girls in the present study such as certain dietary restrictions (avoiding pickles, sour, hot foods, etc.), discontinuation of physical activities or outdoor games, restricting kitchen work/not cooking food, with not performing religious activities or visiting holy places being the commonest limitation. This is almost similar to other studies across India conducted by Deshpande et al., Savarna et al., Zaidi et al., Surana A et al., Sarkar I et al., Sajjan SV et al., Ray S et al., where not performing religious rituals was found to be the most common restriction observed [18,27,19,15,22,24,30]. This clearly indicates that menstruation is considered filthy or impure and large number of such traditional beliefs and taboos still prevail in our society.

School absenteeism was also observed in 144(28.8%) girls, and the most common reason cited was 103(20.6%) pain, followed by 18(3.6%) fear of leakage/staining of clothes, 15(3%) feeling of uncomfortable and 8(1.6%) no place to change or dispose pads. Absence from school was also reported by several other studies [5,27,19,24,26,31].

In India, women keep their pads hidden from the male house hold guests'eyes. The store owner always provides sanitary pads completely wrapped in newspaper [33]. Girls in many low- and middle-income countries experience misconceptions about puberty because of the issue's poor acknowledgment and lack of attention [34]. Parents and teachers are among the adults who are uninformed and uncomfortable talking about sexuality, fertility, and menstruation around them

[35]. These sociocultural constraints make menstruation a burden and a time when they experience anxiety, disgust, and shame [36]. The most common premenstrual issues were dysmenorrhea symptoms, which were connected to several myths and practices that aggravated menstrual hygiene [37].

Conclusions

The present study concluded that the majority of girls are still subjected to various restrictions and barrier during menses. Girls hesitate when discussing sensitive topics like menstrual hygiene, it is important to create a healthy environment where everyone can talk honestly about their personal experiences with this type of delicate subject. Education of girls pertaining to the basic knowledge of menstruation and hygienic practices should be more emphasized in the school curriculum. It is imperative to bring them out of age-old traditional beliefs, taboos, misconceptions, and restrictions and equip them with lifelong skills regarding safe and hygienic practices. Teachers should be trained about menstrual health to empower them to transfer correct scientific information to girls through focused group discussions and other Information Education Communication (IEC) mediums in school, facilitate peer education and engage parents, especially mothers, during parent-teacher meetings to raise menstrual-related awareness. Medical check-up camp should be organized time to time in Government as wells as private school for awareness and screening of menstruation related problem, knowledge and practice for menstruation hygiene.

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