

Original Article

Comparison of Knowledge and Practices of Menstrual Hygiene Among Urban and Rural Secondary School Girls in Faisalabad

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Abstract

Objective: To compare menstrual hygiene knowledge and practice among urban and rural school's girls, in Faisalabad.

Methodology: This Comparative cross-sectional study was conducted at Sacred Heart Convent High School Faisalabad and Government Girls Higher Secondary School Khurrianwala from June to Sept 2024, among 200 urban and 200 rural school girls aged 13-16 years studied in 8th to 10th grade in Faisalabad. A non-probability convenient sampling technique was used. Girls who had experienced menarche and were present in school at the time of data collection were included and those who were sick and absent were excluded from the study. Data entry and analysis were computed using SPSS version 27. Descriptive statistics and a chi-square test were used. A p-value less than or equal to 0.05 was deemed statistically significant.

Results: A large number of urban 103(53.09) and rural 156(79.18) schoolgirls did not hear about menstrual hygiene before menarche. One hundred and twenty-five (64.46%) urban schoolgirls know that it is a physiological process but the majority of rural schoolgirls 146(74.11%) don't know about it. The majority of urban 184(94.98) and rural 195(98.98) schoolgirls think that school latrines are not comfortable for changing sanitary material. The majority of schoolgirls 193(99.4%) urban and 197(100%) rural change their sanitary pads every day during menstruation.

Conclusion: Knowledge regarding menstruation and menstrual hygiene was poor in the number of participants. It also reveals that the school environment is not convenient for changing and disposing of pads. It is recommended, to gain SDGs, the government should advance and implement a curriculum including reproductive health and concerns related to menstruation.

Keywords: Menstrual Hygiene, Knowledge, Practice

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Introduction

According to World Health Organization 10 to 19 years of age is considered in adolescence, the time of onset of puberty, and secondary sexual characteristics.¹ Among all sexual and reproductive complications that arise worldwide, a grave problem faced by females of reproductive age is menstrual hygiene.² About 16% of the world population constitutes adolescents i.e.; the age during which psychological, cognitive, and physical changes occur in the body affecting emotions, and the ability to think, react, and interact socially. Menarche is the point where girls transition from childhood to womanhood. This is the base of menstruation, an

important part of a girl's reproductive cycle.³ Menstrual hygiene management concerns with personal hygiene, which includes bathing, using sanitary pads, and disposing of them during menstruation.⁴

About 1.8 billion girls worldwide menstruate each month. Despite menstruation being a natural process most young girls face difficulty in managing it effectively, especially at school.⁵ Girls and women are uncomfortable talking about menstruation even with their family and close friends.⁶ Mother and female relatives are the main source of information for girls about menstrual hygiene management (MHM) but they

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fail to provide awareness resulting in confusion and misunderstandings about the management of MHM.⁷

Menstrual hygiene management is one of the most important problems in Pakistan especially in areas with low income where even basic facilities on menstrual hygiene are not provided to girls and women. According to research conducted by UNICEF about 44% of females are devoid of menstrual hygiene facilities at home, job, or school. About 49% of women were unaware of menstruation before their first periods. Girls get information mainly from their mothers or teachers. About two-thirds of the girls cannot afford sanitary products and the remaining use different quality products.⁸ In schools' girls are not taught about menstruation and in the country, many families consider it a stigma. Lack of sanitary products can lead to negative effects on women and girl's education and health.⁹

A major factor is lack or insufficient water in schools or workplaces, according to one research about 335 million girls attended schools with no water facilities. About 20% of the girls are absent monthly from school.¹⁰ The reason for girls being absent was studied and according to that research about 92.5% of girls were absent due to stomach or back pain, 38.5% due to lack of privacy for changing pads, 60% due to general feeling of being unwell, and 38.5% because of fear of blood leakage and humiliation.¹¹

Incomplete girls' education regarding menstruation gives rise to a large number of problems. Among them are: decreased social activity, missed hours and days from school, and last but not least anxiety.¹² It has been observed that many women do not get normal menstrual bleeding or absence of menstruation bleeding during their menstrual cycle due to stress and anxiety.¹³ According to another study carried out in Ethiopia adolescent women that have deprivation of menstrual hygiene may develop reproductive tract infection, anemia, vaginal discharge, itching, and in many cases infertility.¹⁴ In a recent evaluation it was discovered that women started using cheap menstrual material that is much more affordable but less hygienic because of the expensiveness of hygienic material. This so-called hygienic material which is economical is cleaned and dried in unclean, tarnished, filthy conditions.¹⁵

Proper awareness is needed on an individual basis to understand and manage the facts of the menstruation cycle and the ways to cope with this in a fearless way

and with ease.¹⁶ To effectively manage all of their issues girls should be facilitated with privacy for changing pads or sanitary material and cleaning the body and hands with soap and water, privacy for washing smears from clothes with soap and water, and also facilities for drying reusable materials and proper disposal facilities for used menstrual items from the collection to disposing of.¹⁷ Some studies have interpreted that menstrual hygiene problems are more common in rural areas than in urban. Several researches have been done in Ethiopia about menstrual hygiene but urban and rural-based research about MHM in school girls is not done. Rural girls lack knowledge about menstrual hygiene and its management.

Methodology

This questionnaire-based comparative cross-sectional study was conducted among urban and rural school girls aged 13-16 in Faisalabad from June to Sept 2024, targeted both private & government schools for our research which were randomly selected owing to our feasibility. Sacred Heart Convent High School Faisalabad and Government Girls Higher Secondary School Khurrianwala were selected for urban and rural data collection respectively. This study aimed at females of 8th to 10th grade who had experienced menarche and were present in school at the time of data collection and those who were sick and absent were excluded from the study. Prior permission and approval were also taken from the respective school management.

A non-probability convenient sampling technique was used. 400 forms were distributed evenly to these schools i.e. 200 each. After forms completion, 9 forms were found incomplete. This left us with 197 forms for the rural area and 194 for the urban area. Ethical approval was obtained from the Ethical Research Committee of Aziz Fatima Medical & Dental College ref no. IEC/305-24.

Data was collected from 7th June to 15th June 2024 using a validated questionnaire from literature [2] for which permission has been taken from the corresponding author. The questionnaire consists of 5 parts which inquire about the socio-demographic categories of the participants & their parents \ guardians, sources of information & knowledge regarding menstruation & menstrual hygiene, and Practice of menstrual hygiene. Informed consent was taken and they were allowed to

ask any relevant question. The data collectors assisted the students in filling out the questionnaire and for those who found difficulty in understanding them, questions were translated into their native language for their ease. To maintain the anonymity of the participants, they were asked not to write their names, or anything on the questionnaire that would reveal their identity.

Data entry and analysis were computed using SPSS version 27. Descriptive statistics, comprising mean and standard deviations were calculated. A Chi-square test was used to assess and compare the menstrual hygiene knowledge and practice between urban and rural school girls. A p-value less than or equal to 0.05 was deemed statistically significant. Participation was fully voluntary and verbal and written consent was taken both from students and their teacher before data collection. Those who were reluctant to participate had their decision respected. Respondents' attention was directed to withdrawing their consent at any time and they could refuse to answer a question that they were not comfortable with. Complete confidentiality was maintained during the data collection and respondents were instructed not to give any identification mark on the questionnaire.

Results

Two hundred girls from both groups (rural and urban) took part in the study. The mean age of rural schoolgirls was 14.76 years and the mean age of urban schoolgirls was 13.96 years. All the urban and rural girls were below 18 years of age. The mean age of menarche of rural schoolgirls was 12.79 years and the mean age of urban schoolgirls was 11.80 years. One hundred and ninety-three (97.9%) of rural and one hundred (51.5%) urban schoolgirls were Muslims. A large number of urban 103(53.09%) and rural 156(79.18%) schoolgirls did not hear about menstrual hygiene before menarche. About equal percentage of urban 190(97.93%) and rural 194(98.47%) schoolgirls discussed menstrual hygiene with their parents. The majority of urban 161(82.98%) and rural 100(50.76%) schoolgirls learned about menstrual hygiene at their school.

Although every school in the urban and rural areas had separate latrines but the latrines have lots of other hygiene problems such as there is no hand washing facility inside the latrines. There were smell, flies, fecal matter, and urine near the toilet seats. That is why the majority of urban 184(94.84%) and rural 195(98.98%)

schoolgirls think that school latrines are not comfortable for changing sanitary material. Unfortunately, only 33(17.01%) urban and 11(5.58%) rural schoolgirls think that school water is comfortable for menstrual hygiene.

Table I: Socio-demographic characteristics of urban and rural schoolgirls of Faisalabad. (N=391)

Variable	Category	Urban= 194	Rural= 197	Total
Religion				
	Christian	91(46.9)	4(2.03)	95(24.3)
	Muslim	100 (51.5)	193 (.97.9)	293 (74.93)
	Others	3(1.54)	0(0.0)	3(0.77)
Educational status of the mother				
	Not read and write	4 (2.061)	26 (13.2)	30 (7.67)
	Read and write	6 (3.09)	44 (22.33)	50 (12.78)
	Primary (1-8)	21 (10.82)	59 (29.94)	80 (20.46)
	Secondary (9-12 0)	72 (37.11)	51 (25.88)	123 (31.45)
	College and above	91 (46.90)	17 (8.62)	108 (27.109)
Educational status of the father				
	Not read and write	3 (15.49)	28 (14.21)	31 (7.928)
	Read and write	4 (2.06)	28 (14.21)	32 (8.18)
	Primary (1-8)	18 (9.27)	48 (24.36)	66 (16.87)
	Secondary (9-12)	80 (41.23)	72 (36.54)	152 (38.87)
	College and above	89 (45.87)	21 (10.65)	110 (28.13)
Occupational status of the mother				
	Housewife	153 (78.86)	189 (95.93)	342 (87.46)
	Daily labor	3(1.54)	2(1.01)	5(1.27)
	Government employee	9 (4.63)	2 (1.015)	11 (2.81)
	Private organization	18 (9.27)	10 (0.507)	19 (4.85)
	others	11(5.67)	3(1.52)	14(3.58)
Occupational status of the father				
	Farmer	1 (0.51)	21 (95.93)	22 (87.46)
	Daily labour	12 (1.54)	99 (1.01)	111 (1.27)
	Merchant	27 (4.63)	11 (1.015)	38 (2.81)
	Government employee	27 (9.27)	15 (0.507)	42 (4.85)
	Private organization	50 (5.67)	18 (1.52)	68 (3.58)

Most of the schoolgirls know about menstrual hygiene. One hundred and twenty-five (64.43%) urban

Table II: Source of Information Regarding Menstrual Hygiene in Urban & Rural School Girls of Faisalabad. (N= 391)

Variable	Urban Urban = 194 (n)%	Rural Rural = 197 (n)%	Total (n)%	P Value
Heard about menstrual hygiene before menarche				
Yes	91 (46.90)	41 (20.81)	132 (33.75)	0.001
No	103 (53.09)	156 (79.18)	259 (66.24)	
Discussed about menstrual hygiene with the parents				
Yes	190 (97.93)	194 (98.47)	384 (98.20)	0.688
No	4(2.06)	3(1.522)	7(1.79)	
Learned about the menstrual hygiene at school				
Yes	161 (82.98)	100 (50.76)	261 (66.75)	0.001
No	33 (17.01)	97 (49.23)	130 (33.24)	
School latrine comfortable to change sanitary materials				
Yes	10(5.15)	2(1.01)	12(3.06)	0.018
No	184 (94.84)	195 (98.98)	379 (96.93)	
School water comfortable to keep menstrual hygiene				
Yes	33 (17.01)	11 (5.58)	44 (11.25)	0.001
No	161 (82.98)	186 (94.41)	347 (88.74)	

schoolgirls know that it is a physiological process but the majority of rural schoolgirls one hundred and forty-six (74.11%) don't know about it. In general, the menstrual hygiene management was good. The majority of schoolgirls one hundred and ninety-three (99.4%) urban and one hundred and ninety-two (97.5%) rural wash their external genitalia while at the time of menstruation. The majority of schoolgirls one hundred and ninety-three (99.4%) urban and one hundred and ninety-seven (100%) rural change their sanitary pads every day during menstruation.

Table III: Knowledge Regarding Menstruation and Menstrual Hygiene.

Variables	Urban N (%)	Rural N (%)	Total N (%)	P Value
Know about menstruation?				
Yes	193 (99.48)	195 (98.98)	388 (99.23)	0.610
No	1(0.51)	1(0.50)	2(0.51)	
What is menstruation?				
Physiological process	125 (64.43)	49 (24.87)	174 (44.50)	0.001
Curse from God	15 (7.73)	0 (0)	15 (3.83)	
Pathological Process	0 (0)	1 (0.50)	1 (0.25)	
Don't Know	5 4(27.83)	146 (74.11)	200 (51.15)	
Source of Menstrual Blood				

Vagina	27(13.91)	0(0)	27(6.90)	0.001
Urinary Bladder	11(5.67)	0(0)	11(2.81)	
Uterus	46(23.71)	1(0.50)	47(12.02)	
Don't Know	109 (56.1)	194 (98.47)	303 (77.49)	
Normal Menstrual Bleeding Duration				
< 2 days	9(4.63)	12(6.09)	21(5.37)	0.001
2-7 days	153 (78.86)	101 (51.26)	254 (64.96)	
> 7 days	24(12.37)	75(38.07)	99(25.31)	
Don't Know	6(3.09)	8(4.06)	14(3.58)	
Normal Menstrual Cycle				
< 21 days	37(19.07)	35(17.76)	72(18.41)	0.827
21 to 35 days	88 (45.36)	94 (47.71)	182 (46.54)	
> 35 days	22(11.34)	24(12.18)	46(11.76)	
Don't know	47(24.22)	43(21.82)	90(23.01)	
Taking more nutrition during menses				
Yes	160 (82.47)	113 (57.36)	273 (69.82)	0.001
No	34 (17.52)	83 (42.13)	117 (29.92)	
Washing perineum during menses				
Yes	192 (98.96)	188 (95.43)	380 (97.18)	0.034
No	2(1.03)	9(4.56)	11(2.81)	
Bathing doesn't cause infertility				
Yes	65 (33.50)	49 (24.8)	114 (29.15)	0.060
No	129 (66.49)	148 (75.12)	277 (70.84)	
Painkillers taken during painful menses				
Yes	60 (30.92)	77 (39.08)	137 (35.03)	0.091
No	134 (69.07)	120 (60.91)	254 (64.96)	
Know about ideal sanitary material				
Yes	136 (70.10)	30 (18.1)	166 (42.45)	0.001
No	58 (29.89)	167 (74.2)	225 (57.54)	
Ideal sanitary material				
Commercial sanitary pad	134 (69.07)	25 (15.22)	159 (40.66)	0.001
New cloth	1(0.51)	2(1.01)	3(0.76)	
Old cloth	0(0)	3(1.52)	3(0.76)	

Discussion

A total of 391 secondary school girls participated in our study. Our findings indicated a huge gap between urban and rural girls, knowledge and practices. Apart from the urban-rural gap, the overall knowledge of both urban and rural schoolgirls was poor.

In our study about (44.50%) of respondents thought that menstruation is a physiological process, and (51%) didn't know about its etiology, in a study in Odisha, India about (74.3%) of respondents knew that menstruation is a physiological process, while (14.4%)

were unaware of its etiology¹⁸ because of better literacy rate. In our study (3.83%) of the girls considered menstruation to be a "Curse of God" and similarly in a study of Odisha, India around (6.7%) of participants said menstruation is a "Curse of God"¹⁸. However, this data shows a smaller percentage of the population has misconceptions but a study done in Quetta, Pakistan where (27.1%) of girls believed that menstruation is a "Curse of God" indicative that this area of Pakistan needs relatively more awareness.¹⁹

Table IV: Practice about menstrual hygiene.

Variable s	Urban N (%)	Rural N (%)	Total N (%)	P value
Use sanitary material(s) during menstruation?				
Yes	194 (100)	195(99)	389 (99.5)	0.319
No	0 (0.0)	2 (1.0)	2(0.5)	
Clean external genitalia during menstruation per day?				
Yes	193 (99.4)	192 (97.5)	385 (98.5)	0.109
No	1 (0.51)	5 (2.5)	6 (1.5)	
Take a shower during the menstrual period per day?				
Yes	138 (89.6)	133 (67.5)	271 (69.3)	0.438
No	56 (28.9)	64 (32.5)	120 (30.7)	
How often do you take a shower during menstruation per day?				
One time	111 (80.4)	109 (82)	220 (81.2)	0.152
Twice	23 (16.7)	14 (10.5)	37 (13.7)	
Three or more	4 (2.9)	10 (7.5)	14 (5.1)	
Change your sanitary material(s) during menstruation per day				
Yes	193 (98.5)	197 (100)	390 (99.7)	0.313
No	1 (0.5)	0 (0.0)	1 (0.26)	
How often do you change your sanitary material (s) during menstruation per day?				
One time	27 (13.9)	65 (33)	92 (23.5)	0.001
Twice	61 (31.4)	91 (46.1)	152 (38.9)	
Three times	106 (54.6)	41 (20.8)	147 (37.6)	
Where do you place your sanitary material?				
Reuse it	1 (0.5)	2 (1.01)	3 (0.8)	0.511
Dispose of it	193 (99.5)	195 (98.9)	388 (99.2)	
Disposal of menstrual materials after use?				
Open field	0 (0.0)	4 (2.1)	4 (1.03)	0.004
Latrine	4 (2.07)	1 (0.5)	5 (1.2)	
Dustbin	187 (96.9)	178 (91.3)	365 (94.1)	
Others	2 (1.03)	12 (6.2)	14 (3.6)	

77% Girls in our data didn't know about where menstrual blood comes from contrasting the studies where (6.08%) and where (11.5%) didn't know about where the menstrual blood comes from.^{19,20}

Our results also revealed potentially good mother-daughter communication about menstruation where over (82.09%) of girls frequently discussed menstrual hygiene with their mothers supplemented by a study done in Tanzania and Boset District, Ethiopia.^{21,22}

Despite being living in the 21st century menstruation remains an overlooked topic in many of the school syllabuses which further supplements the gap between accurate knowledge and misconceptions regarding menstrual health. Our study indicated that (33.24%) of girls, and a similar study done in the setting of Quetta, Pakistan yielded that about (77.7%) of girls weren't taught about menstrual hygiene in school.²² Projecting that we need to discuss menstrual hygiene more openly in our classrooms.

Our findings revealed that (46.54%) of girls believe 21 to 35 days to be of normal menstrual period while (18.41%) also considered it to be less than 21 days. A study in Buraidah city supplemented our findings and reported that (42.6%) of participants believed that the normal menstrual cycle is 21 to 35 days and (24.8%) considered the normal menstrual cycle to be less than 21 days demonstrating the lack of knowledge among adolescents.²³

A study done in Ghizer, Gilgit, Pakistan found that more than 50% of their participants had not received education regarding menstrual hygiene at school/college. In this study, 66.75% of participants learned about menstruation in school. Prior information regarding menstrual hygiene before menarche in a study conducted in Sindh revealed a P value of 0.043 whereas comparatively in our study it was less than 0.001.²⁵

In comparison with a study done in Ghana where almost all (99%) of the students responded Yes to taking a bath and very few (1%) indicated that they do not bath during menstruation. Our (69.3%) of participants said yes to taking a bath whereas (30.7%) said no.²² Our findings are also similar to a study in which (22.2%) of participants did not have a habit of taking baths during menstruation.¹²

In our study (98.5%) participants washed their genitalia during menstruation A comparative study in Rajshahi division, Bangladesh, and another study in Quetta, Pakistan yielded similar findings.^{6,24}

Whereas in our study (81.2%) of participants bathed only once (13.7%) bathed twice and (5.15%) bathed thrice, However Regarding the frequency of bathing in

the study done in Ghana (96.67%) students had their bath twice a day similar to a study in Taraba State, Nigeria where (82.2%) of girls bathed twice daily during their menstrual periods.^{22,3}

On a method of disposal, this study revealed that most of the students (94.1%) disposed of their menstrual hygiene products in dustbins, (1.2%) in latrines, and (1.03%) in open fields. This is at variance from the study in Taraba State, Nigeria revealed that most adolescents disposed of used absorbents in the latrines (34.7%), by burning (27.3%), in dustbins (25.6%).³ A similar study in Tanzania where (46%) of girls reported the disposal of their used menstrual sanitary materials in the latrine/toilet.¹³ Another study favoring our findings in which (23.3%) of participants wrapped the used sanitary material and threw it in a garbage can.²⁶

A study among secondary school girls in eastern Ethiopia yielded (31.3%) of participants reused their menstrual hygiene products contrasting our study where (0.8%) of schoolgirls reused their menstrual products and a majority of (99.2%) disposed of their menstrual products.¹⁰

A School-based study, in Siha, Kilimanjaro, Tanzania revealed (58.8%) of girls reported using pieces of old cloth during menstruation contrasting to our study where a very minute amount (0.76%) still uses old clothes.¹¹

Conclusion

Our study aimed to compare menstrual hygiene management (MHM) among urban and rural school girls and showed that age, the educational status of the mother, and the occupational status of the guardian are the main determinants. Knowledge regarding menstruation and menstrual hygiene was poor in the number of participants. Schools and conducive family environments can play a significant part in educating and promoting menstrual hygiene among adolescents. It is needed to make MHM facilities available and affordable to every girl especially rural resident.

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References

1. Nnennaya EU, Atinge S, Dogara SP, Ubandoma RJ. Menstrual hygiene management among adolescent school girls in Taraba State, Nigeria. *Afr Health Sci.* 2021;21(2):842-51. doi:10.4314/ahs.v21i2.45.
2. World Health Organization. Adolescent health in the South-East Asia region. 2021 [cited 2024 May 5]. Available from: <https://www.who.int/southeastasia/healthtopics/adolescent-health>.
3. Shibeshi BY, Emiru AA, Asresie MB. Disparities in menstrual hygiene management between urban and rural schoolgirls in Northeast, Ethiopia. *PLoS One.* 2021; Available from: <https://doi.org/10.1371/journal.pone.0257853>.
4. United Nations International Children's Emergency Fund (UNICEF). WASH in Schools Empowers Girls' Education- Proceedings of the Menstrual Hygiene Management in Schools meeting. UNICEF; 2012.
5. UNICEF. Menstrual hygiene: Gender inequality, cultural taboos, and poverty can cause menstrual health needs to go unmet. 2021 [cited 2024 May 5]. Available from: <https://www.unicef.org/wash/menstrual-hygiene>.
6. Patkar A. Policy and practice pathways to addressing menstrual stigma and discrimination. In: *The Palgrave Handbook of Critical Menstruation Studies.* 2020:485-509. doi:10.1007/978-981-15-0614-7_38.
7. Talha MA, Alam MZ. Menstrual hygiene management practice among adolescent girls: an urban-rural comparative study in Rajshahi division, Bangladesh. *BMC Women's Health.* 2022;22:86. doi:10.1186/s12905-022-01665-6.
8. Michael J, Iqbal Q, Haider S, Khalid A, Haque N, Ishaq R, Saleem F, et al. Knowledge and practice of adolescent females about menstruation and menstruation hygiene visiting a public healthcare institute of Quetta, Pakistan. *BMC Women's Health.* 2020;20:1-8. doi:10.1186/s12905-019-0874-3.
9. Malik M, Hashmi A, Hussain A, Khan W, Jahangir N, Malik A, Ansari N. Experiences, awareness, perceptions, and attitudes of women and girls towards menstrual hygiene management and safe menstrual products in Pakistan. *Front Public Health.* 2023;11:1242169. doi:10.3389/fpubh.2023.1242169.
10. Hussein J, Gobena T, Gashaw T. The practice of menstrual hygiene management and associated factors among secondary school girls in eastern Ethiopia: The need for water, sanitation, and hygiene support. *Women's Health.* 2022;18. doi:10.1177/17455057221087871.
11. Method A, Hassan J, Assenga O, Kamugisha P, Kawishe T, Luchagura F, Msaka P, et al. Challenges faced by adolescent girls on menstrual hygiene management: School-based study, Siha, Kilimanjaro, Tanzania. *PLoS Glob Public Health.* 2024;4(6):e0002842. doi:10.1371/journal.pgph.0002842.
12. Sommer M, Caruso BA, Torondel B, Warren EC, Yamakoshi B, Haver J, et al. Menstrual hygiene management in schools: midway progress update on the "MHM in Ten" 2014-2024 global agenda. *Health Res Policy Syst.* 2021;19(1):1. doi:10.1186/s12961-020-00669-8.
13. Hennegan J, Winkler IT, Bobel C, Keiser D, Hampton J, Larsson G, Chandra-Mouli V, et al. Menstrual health: a definition for policy, practice, and research. *Sex Reprod Health Matters.* 2021;29(1):1911618. doi:10.1080/26410397.2021.1911618.

14. Siddique AB, Deb Nath S, Mubarak M. Assessment of knowledge, attitudes, and practices regarding menstruation and menstrual hygiene among early reproductive-aged women in Bangladesh: a cross-sectional survey. *Front Public Health.* 2023;11:1238290. doi:10.3389/fpubh.2023.1238290.
15. Chakrabarty M, Singh A, Let S. Decomposing the rural-urban gap in hygienic material use during menstruation among adolescent women in India. *Sci Rep.* 2023;13:22427. doi:10.1038/s41598-023-49682-1.
16. Patel K, Panda N, Sahoo KC. A systematic review of menstrual hygiene management (MHM) during humanitarian crises and/or emergencies in low- and middle-income countries. *Front Public Health.* 2022;10:1018092. doi:10.3389/fpubh.2022.1018092.
17. Onubogu CU, Umeh UM, Mbachu CNP. Menstrual hygiene practices of adolescent secondary school girls in rural Anambra communities. *Women's Health.* 2024;20. doi:10.1177/17455057241228204.
18. Panda N, Desaraju S, Panigrahy RP, Ghosh U, Saxena S, Singh P, Panda B, et al. Menstrual health and hygiene amongst adolescent girls and women of reproductive age: a study of practices and predictors, Odisha, India. *BMC Women's Health.* 2024;24:144. doi:10.1186/s12905-024-02894-7.
19. Gena M, Hussein M. Menstrual hygiene management practices and associated factors among secondary school girls in East Hararghe Zone, Eastern Ethiopia. *Adv Public Health.* 2020;8938615:7. doi:10.1155/2020/8938615.
20. Appiah-Agyekum NN, Nyamekye MA, Agbenu IA, Otoo DD. Menstrual hygiene knowledge and practices among senior high school students in the New Juabeng North Municipality of Ghana. *Res Square.* 2024. doi:10.21203/rs.3.rs-4241758/v1.
21. Gebre W, Kidane EM, Negussie YM, Getahun MS, Bekele NT, Gurara AM. Assessment of menstrual hygiene management knowledge, practice, and associated factors among girls in Boset District, Ethiopia: a school-based cross-sectional study. *Contracept Reprod Med.* 2023;8:34. doi:10.1186/s40834-023-00233-z.
22. Al Mutairi H, Jahan S. Knowledge and practice of self-hygiene during menstruation among female adolescent students in Buraidah city. *J Family Med Prim Care.* 2021;10:1569-75. doi:10.4103/jfmpc.jfmpc_2321_20.
23. Shah SF, Punjani NS, Rizvi SN, et al. Knowledge, attitudes, and practices regarding menstrual hygiene among girls in Ghizer, Gilgit, Pakistan. *Int J Environ Res Public Health.* 2023;20:6424. doi:10.3390/ijerph20146424.
24. Aziz A, Memon S, Aziz F, Memon F, Khowaja BM, Naeem Zafar S. Comparative study of the knowledge and practices related to menstrual hygiene among adolescent girls in urban and rural areas of Sindh, Pakistan: A cross-sectional study. *Women's Health.* 2024. doi:10.1177/17455057241231420.
25. Mohan M, Sunilkumar M, Thambi MS, Nizar MN, Ali M, Gopakumar S, Akshay KR, et al. Knowledge, attitude, and practices of menstrual hygiene among high school girls in Government Medical College Higher Secondary School, Thiruvananthapuram. *Kerala Med J.* 2024;17(2):67-74.