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Assessment of Knowledge, Attitude, and Practice Regarding Menstruation and Menstrual Hygiene among School Going Girls in Rural Areas of Lahore, Punjab

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ABSTRACT

Background: *Menstrual hygiene management (MHM) is fundamental to adolescent health and school participation, yet in rural settings it is frequently constrained by incomplete knowledge, sociocultural stigma, and suboptimal school WASH resources.* ***Objective***: *To assess knowledge, attitudes, and practices regarding menstruation and MHM among school-going girls in rural areas of Lahore, Punjab, Pakistan.* ***Methods***: *A descriptive cross-sectional observational survey was conducted among 385 school-going adolescent girls aged 10–19 years in rural Lahore. Participants completed a structured, close-ended questionnaire adapted for context, assessing socio-demographics, menstrual knowledge, attitudes (Likert-scale), hygiene practices, disposal behaviours, school-based pad changing, dysmenorrhea, and reported access to washing soap at school. Data were analyzed using descriptive statistics (frequencies, percentages).* ***Results***: *Knowledge was mixed: 44.2% (n=170) identified menstruation as a normal physiological process, 36.6% (n=141) attributed it to hormones, and 41.8% (n=161) did not know the cause; 22.6% (n=87) incorrectly reported the bladder as the origin of menstrual blood. Only 23.6% (n=91) were aware of menstruation at menarche, and mothers were the predominant information source (84.2%, n=324). Attitudes largely supported hygienic practices (e.g., 88.6% agreed that handwashing after genital cleaning prevents reproductive tract infections). Practices were comparatively favourable: 68.6% (n=264) used sanitary pads, 44.2% (n=170) changed absorbents ≥3 times/day, and 93.8% (n=361) reported genital cleansing; however, only 14.8% (n=57) changed pads at school. Soap access at school was reported by 63.4% (n=244). Dysmenorrhea was common (83.1%, n=320).* ***Conclusion***: *Rural schoolgirls in Lahore reported generally positive menstrual hygiene practices and supportive attitudes, but substantial knowledge gaps and low preparedness at menarche persist alongside incomplete school enabling conditions, underscoring the need for school-based MHM education integrated with reliable WASH and disposal supports.*

Keywords

menstruation; menstrual hygiene management; adolescent girls; school health; WASH; rural Pakistan; Lahore; dysmenorrhea

INTRODUCTION

Menstrual hygiene management (MHM) is a core component of adolescent health, dignity, and educational participation, yet it remains constrained in many low- and middle-income settings by inadequate information, restrictive sociocultural norms, and gaps in school water, sanitation, and hygiene (WASH) provision (1). Beyond comfort and privacy, girls' confidence to manage menstruation at home and at school is increasingly recognized as a measurable construct that influences everyday coping and school functioning, and this confidence is shaped by both knowledge and the enabling environment (2). Menarche typically occurs during early adolescence and represents a salient pubertal milestone; however, many adolescents enter this transition with limited preparedness, which can amplify fear, shame, and avoidant behaviours (3). While menstruation is a normal physiological process, misconceptions about its cause, origin, and "cleanliness" remain common, and these misconceptions can interact with taboo to restrict evidence-based self-care and help-seeking (4). In practical terms, MHM requires not only accurate knowledge but also the routine ability to use a clean absorbent, change it as needed, wash hands, clean the external genital area with appropriate materials, bathe and launder reusable clothing safely, and dispose of used absorbents discreetly and safely—behaviours that are strongly dependent on access to water, soap, privacy, and disposal options in schools (5). Empirical work has repeatedly shown that knowledge, attitudes, and hygiene practices are heterogeneous within and across communities, and that the school setting can either enable safe practice or reinforce constraints through inadequate WASH, limited disposal systems, or lack of supportive adults (6).

The determinants of menstrual practices are multifactorial, spanning household resources, market access, school infrastructure, and the sociocultural environment (7). In settings where menstruation is framed as secretive, shameful, or "impure," girls may restrict daily routines, avoid pad changing in school, conceal drying of washed undergarments, or substitute less effective absorbents—patterns that can increase discomfort and may plausibly elevate vulnerability to urogenital symptoms and infections, particularly when combined with poor hand hygiene or infrequent changing of absorbents (8). Workplace and school literature similarly emphasizes that menstrual management is not only a private matter but also an equity issue, as structural barriers to hygiene supplies and facilities can shape participation and wellbeing (9). Menstrual stigma is also implicated in gender inequality, with broader consequences for autonomy, mobility, and education; dismantling taboos therefore requires both accurate education and enabling environments (10). Consistent with this, school-based studies have demonstrated that awareness and MHM practices vary substantially even within the same region and school grade, often reflecting differences in parental education, exposure to accurate information, and local norms (11). Evidence from diverse adolescent populations further indicates that attitudes towards hygiene behaviours—such as the

perceived importance of soap, cotton underwear, and handwashing—can be supportive even when underlying biomedical knowledge remains incomplete, creating an opportunity for targeted education that corrects misconceptions while reinforcing existing positive norms (12).

Within South Asia, several studies have quantified gaps in knowledge and practice among adolescents, underscoring the importance of context-specific assessment to guide school health programming (13). Qualitative synthesis across low- and middle-income countries also shows that girls' experiences of menstruation are shaped by intersecting constraints—privacy, disposal, pain management, and stigma—making it insufficient to focus solely on product use without addressing the broader MHM system (14). In Pakistan and neighbouring contexts, adolescent menstrual hygiene has been documented as an area of persistent informational deficits and normative constraints, even as commercial availability of absorbents has increased in some communities (15). Urban and peri-urban studies in the region suggest that knowledge and practices differ by setting and socio-economic conditions, and that school-going adolescents may still face practical barriers to changing absorbents at school despite reporting otherwise favorable hygiene attitudes (16). Early national work on youth reproductive health in Pakistan similarly highlights that perceptions, attitudes, and practices are shaped by limited formal reproductive health education and reliance on informal information channels, particularly within families (17). This body of evidence supports the need for local, school-based data that jointly capture knowledge (including misconceptions), attitudes (including stigma-related beliefs), and practices (including absorbent use, changing frequency, hygiene behaviours, and disposal), alongside key enabling conditions such as access to soap and water (18).

Despite the growing literature, a clear knowledge gap remains for rural school-going girls in Lahore, Punjab: published evidence is limited on the specific profile of misconceptions (e.g., cause and origin of menstrual blood), preparedness at menarche, and school-based enabling factors that shape day-to-day practice in this setting. Existing Pakistan-based studies have reported low preparedness at menarche and heavy dependence on mothers for menstrual information in low-income communities, but these findings cannot be assumed to generalize across rural districts and school contexts within Punjab (19). More recent work from northern Pakistan further demonstrates substantial variability in menstrual hygiene knowledge and practices across regions, suggesting that localized assessment is necessary to design and target interventions effectively (20). International comparators—from Nigeria and India to Nepal and Ethiopia—show wide variation in sanitary pad use, changing frequency, bathing practices, and disposal behaviours, reinforcing that context matters and that school-level constraints may meaningfully shape reported practices (21). Importantly, these cross-country differences also highlight a methodological imperative: even when girls report positive attitudes towards hygiene, specific misconceptions and practical constraints (e.g., inability to change absorbents at school or limited access to soap) can persist, necessitating a combined assessment of knowledge, attitudes, practices, and the school environment (22). Moreover, evidence from Nepal and Ethiopia indicates that changing frequency, hygienic bathing, and access to supplies and facilities are not uniform and are influenced by structural and educational factors, strengthening the rationale for school-based, multi-component MHM strategies rather than single-focus messaging (23). Accordingly, a focused assessment in rural Lahore is justified to identify which components—preparedness, misconception correction, WASH access, or disposal systems—should be prioritized for adolescent-friendly, school-based interventions (24).

Therefore, the objective of this study was to assess knowledge, attitudes, and practices regarding menstruation and menstrual hygiene management among school-going girls aged 10–19 years in rural areas of Lahore, Punjab, Pakistan, and to describe a key enabling factor within the school environment (reported access to washing soap at school/college). The research question guiding this work was: among school-going adolescent girls in rural Lahore (population), what is the distribution of menstrual knowledge (including misconceptions), attitudes towards hygienic behaviors, and self-reported menstrual hygiene practices (outcomes), and how do these patterns coexist with school-based enabling conditions for hygiene such as access to soap and related WASH supports (context)?

MATERIAL AND METHODS

A quantitative cross-sectional observational study was conducted to describe knowledge, attitudes, and practices related to menstruation and menstrual hygiene management among school-going adolescent girls in rural areas of Lahore, Punjab, Pakistan. This design was selected to allow estimation of the prevalence and distribution of menstrual knowledge, beliefs, and self-reported hygiene behaviours within a defined population at a single point in time, which is appropriate for identifying priority gaps and informing school-based public health interventions. The study was carried out in selected government and private schools located in rural localities of Lahore district, Punjab, Pakistan, during the defined data collection period in the academic year when schools were operational and accessible to the research team.

The study population comprised adolescent girls aged 10–19 years who were enrolled in the selected schools and had attained menarche. Girls who had not yet experienced menarche or who were absent on the days of data collection were excluded to ensure that all respondents could meaningfully answer questions related to menstrual experiences and practices. Participants were selected using a convenience sampling approach due to logistical constraints and school accessibility, with recruitment conducted directly within classrooms after coordination with school administrations. All eligible students present on the day of data collection were invited to participate, and participation was entirely voluntary.

Prior to data collection, the purpose of the study, procedures, potential risks, and benefits were explained in simple, age-appropriate language. Informed consent was obtained from participants, with additional parental or guardian consent obtained as required for minors according to institutional and national ethical standards. Assent was obtained from adolescent participants, and confidentiality was emphasized; no personal identifiers were recorded on the questionnaires. Data were collected in a private classroom setting to minimize peer influence and social desirability bias, and respondents completed the questionnaires independently under the supervision of trained data collectors who were available to clarify questions without prompting responses.

Data were collected using a structured, close-ended questionnaire adapted from previously published instruments assessing menstrual knowledge, attitudes, and practices. The questionnaire was reviewed for contextual relevance, cultural appropriateness, and clarity prior to use. It consisted of sections covering socio-demographic characteristics, knowledge of menstruation (including definition, cause, source of menstrual blood, cycle length, awareness at menarche, and sources of information), attitudes toward menstrual hygiene and related beliefs, and self-reported practices during menstruation (including type of absorbent used, frequency of changing absorbents and underwear, genital hygiene behaviors, bathing and laundering practices, disposal methods, school-based pad changing, and management of menstrual pain). Access to washing soap at school or college was included as a key enabling environmental variable related to menstrual hygiene management.

Knowledge variables were operationalized as correct or incorrect/unknown responses to factual questions regarding menstruation and hygiene. Attitude variables were measured using Likert-scale items reflecting agreement or disagreement with statements related to hygiene, infection

prevention, and menstrual beliefs. Practice variables were defined as self-reported behaviours during the most recent menstrual period. To reduce information bias, questions were phrased in simple, non-judgmental language, and respondents were assured that there were no right or wrong answers. The questionnaire was administered in the local language familiar to participants to ensure comprehension.

The required sample size was calculated using a standard single-population proportion formula for descriptive studies, assuming a 95% confidence level, a 5% margin of error, and an anticipated proportion of adequate menstrual hygiene practices based on prior regional studies. This resulted in a minimum sample size of 385 participants, which was achieved. This sample size was considered sufficient to provide stable estimates of key proportions within the study population.

Data were entered, cleaned, and analyzed using the Statistical Package for Social Sciences (SPSS) version 20. Descriptive statistics were used to summarize the data, including frequencies and percentages for categorical variables. All analyses were conducted using valid responses for each variable; missing data were minimal and were handled using complete-case analysis without imputation. Given the descriptive objective of the study, no inferential hypothesis testing or multivariable modeling was performed. However, internal consistency checks were conducted to ensure alignment between reported frequencies and percentages, and conditional questions were analyzed using appropriate denominators to maintain analytic accuracy. Measures were taken to reduce potential confounding through clear eligibility criteria and standardized data collection procedures across all study sites.

Ethical approval for the study was obtained from the relevant institutional ethics review committee prior to commencement. The study adhered to principles of the Declaration of Helsinki, including respect for persons, beneficence, and confidentiality. Data integrity and reproducibility were ensured through standardized training of data collectors, use of a uniform data collection instrument, double-checking of data entry, and secure storage of completed questionnaires and electronic datasets accessible only to the research team.

RESULTS

The socio-demographic characteristics of the study participants are summarized in Table 1. Among the 385 school-going adolescent girls, the majority were aged 14–16 years (64.4%, n = 248), followed by those aged 17–19 years (23.4%, n = 90), while early adolescents aged 10–13 years constituted 12.2% (n = 47). In terms of educational attainment, more than half of the respondents were studying at the secondary level (52.2%, n = 201), whereas 38.2% (n = 147) were in middle school and only 7.5% (n = 29) had reached higher secondary education. Maternal education showed considerable variability: 26.0% (n = 100) of mothers were illiterate, while 24.4% (n = 94) had secondary education and 22.1% (n = 85) had middle-level education; only a small proportion had attained graduation or higher (4.7%, n = 18). Monthly household income was broadly distributed, with 23.9% (n = 92) reporting PKR 10,000–20,000, 20.8% (n = 80) reporting PKR 21,000–30,000, and 22.9% (n = 88) reporting PKR 31,000–40,000, while 18.7% (n = 72) reported incomes above PKR 50,000. Access to washing soap at school or college was reported by nearly two-thirds of participants (63.4%, n = 244), whereas 36.6% (n = 141) reported no such access.

Knowledge regarding menstruation and menstrual hygiene is detailed in Table 2 and revealed notable gaps and misconceptions. Less than half of the respondents correctly identified menstruation as a normal physiological process (44.2%, n = 170), while 38.7% (n = 149) reported that they did not know what menstruation is, and 15.1% (n = 58) perceived it as a curse of God. With respect to the cause of menstruation, only 36.6% (n = 141) correctly attributed it to hormonal changes, whereas 41.8% (n = 161) reported not knowing the cause and one-fifth (20.0%, n = 77) again cited a curse of God. Misconceptions were also evident regarding the origin of menstrual blood, with only 29.6% (n = 114) correctly identifying the uterus, while substantial proportions attributed it to the vagina (36.6%, n = 141) or the bladder (22.6%, n = 87). Preparedness at menarche was low, as only 23.6% (n = 91) reported being aware of menstruation before their first period, whereas 76.4% (n = 294) were unaware. Mothers emerged as the dominant source of menstrual information (84.2%, n = 324), with teachers (3.9%, n = 15) and friends (11.4%, n = 44) playing comparatively minor roles.

Attitudes toward menstruation and menstrual hygiene, presented in Table 3, were generally supportive of evidence-based hygienic practices despite the observed knowledge deficits. Approximately two-thirds of participants either agreed or strongly agreed that failure to maintain personal hygiene during menstruation can cause disease (69.6%, n = 268), while only 21.0% (n = 81) disagreed or strongly disagreed with this statement. Similarly, 70.6% (n = 272) endorsed the importance of access to clean water and soap for genital hygiene.

Table 1. Socio-demographic Characteristics of Participants (n = 385)

Variable	Category	n	%	p-value
Age group (years)	10–13	47	12.2	NA
	14–16	248	64.4	
	17–19	90	23.4	
Education level	Primary	8	2.1	NA
	Middle	147	38.2	
	Secondary	201	52.2	
	Higher secondary	29	7.5	
Mother's education	Illiterate	100	26.0	NA
	Primary	45	11.7	
	Middle	85	22.1	
	Secondary	94	24.4	
	Intermediate	43	11.2	
	Graduation & above	18	4.7	
Monthly household income (PKR)	10,000–20,000	92	23.9	NA
	21,000–30,000	80	20.8	
	31,000–40,000	88	22.9	
	41,000–50,000	53	13.8	
	>50,000	72	18.7	
Access to washing soap at school	Yes	244	63.4	NA
	No	141	36.6	

Table 2. Knowledge Regarding Menstruation and Menstrual Hygiene (n = 385)

Knowledge item	Response	n	%	p-value
Menstruation is	Normal physiological process	170	44.2	NA
	Disease	8	2.1	
	Curse of God	58	15.1	
	Do not know	149	38.7	
Cause of menstruation	Hormonal	141	36.6	NA
	Curse of God	77	20.0	
	Disease	6	1.6	
	Do not know	161	41.8	
Origin of menstrual blood	Uterus	114	29.6	NA
	Vagina	141	36.6	
	Ovary	21	5.5	
	Bladder	87	22.6	
	Abdomen	22	5.7	
Aware at menarche	Yes	91	23.6	NA
	No	294	76.4	
Primary source of information	Mother	324	84.2	NA
	Teacher	15	3.9	
	Friends	44	11.4	
	Books/media	2	0.6	

Table 3. Attitudes Toward Menstrual Hygiene (Likert Scale) (n = 385)

Statement	Agree/Strongly agree n (%)	Neutral n (%)	Disagree/Strongly disagree n (%)	p-value
Poor hygiene causes disease	268 (69.6)	36 (9.4)	81 (21.0)	NA
Soap and clean water are essential	272 (70.6)	51 (13.2)	62 (16.1)	NA
Cotton underwear is preferable	262 (68.1)	49 (12.7)	74 (19.2)	NA
Handwashing before cleaning prevents RTIs	279 (72.5)	44 (11.4)	62 (16.1)	NA
Handwashing after cleaning prevents RTIs	341 (88.6)	18 (4.7)	26 (6.7)	NA
Menstruation is caused by disease	53 (13.8)	36 (9.4)	296 (76.9)	NA

Table 4. Menstrual Hygiene Practices (n = 385)

Practice variable	Category	n	%	p-value
Absorbent used	Sanitary pad	264	68.6	NA
	Cloth/rag	102	26.5	
	Others	19	4.9	
Pad change frequency/day	≥3 times	170	44.2	NA
	Twice	160	41.6	
	Once	55	14.3	
Genital cleaning during menses	Yes	361	93.8	NA
Handwashing before cleaning	Yes	296	76.9	NA
Handwashing after urination/defecation	Yes	352	91.4	NA
Pad change at school	Yes	57	14.8	NA
	No	328	85.2	
Pad disposal method	Dustbin	319	82.9	NA
	Drain/toilet/open field	66	17.1	

Table 5. Menstrual Pain and Management (n = 385)

Variable	Category	n	%	p-value
Dysmenorrhea	Yes	320	83.1	NA
	No	44	11.4	
	Do not know	21	5.5	
Pain management method	Home remedies	119	30.9	NA
	Medication	105	27.3	
	Hot water bottle	53	13.8	
	None	108	28.1	

Positive attitudes toward specific preventive practices were also evident, with 72.5% (n = 279) agreeing or strongly agreeing that handwashing before cleaning the genital area can prevent reproductive tract infections and an even larger proportion, 88.6% (n = 341), recognizing the protective role of handwashing after genital cleaning. Importantly, most respondents rejected the misconception that menstruation is caused by disease, with 76.9% (n = 296) disagreeing or strongly disagreeing with this belief.

Self-reported menstrual hygiene practices are summarized in Table 4 and indicate comparatively favorable behaviors among the participants. Sanitary pads were the most commonly used absorbent material, reported by 68.6% (n = 264), while 26.5% (n = 102) relied on cloth or rags and a small minority used other materials (4.9%, n = 19). Nearly half of the respondents reported changing their absorbent three or more times per day (44.2%, n = 170), and an additional 41.6% (n = 160) changed twice daily. Genital hygiene practices were widely reported, with 93.8% (n = 361) indicating that they cleaned their genital area during menstruation, 76.9% (n = 296) washing their hands before genital cleaning, and 91.4% (n = 352) cleaning after urination or defecation. Despite these positive practices, changing sanitary pads at school was uncommon, reported by only

14.8% (n = 57), whereas the vast majority (85.2%, n = 328) did not change pads while at school. Disposal practices were largely appropriate, with 82.9% (n = 319) disposing of used absorbents in a dustbin, although 17.1% (n = 66) reported less hygienic methods such as disposal in drains, toilets, or open fields.

Menstrual discomfort and its management are described in Table 5. A high proportion of respondents reported experiencing pain or discomfort during menstruation (83.1%, n = 320), while 11.4% (n = 44) reported no pain and 5.5% (n = 21) were unsure. Among those experiencing dysmenorrhea, coping strategies varied: 30.9% (n = 119) relied on home remedies, 27.3% (n = 105) used medications, and 13.8% (n = 53) used hot-water bottles, whereas more than one-quarter of the participants (28.1%, n = 108) reported using no specific method to relieve menstrual pain.

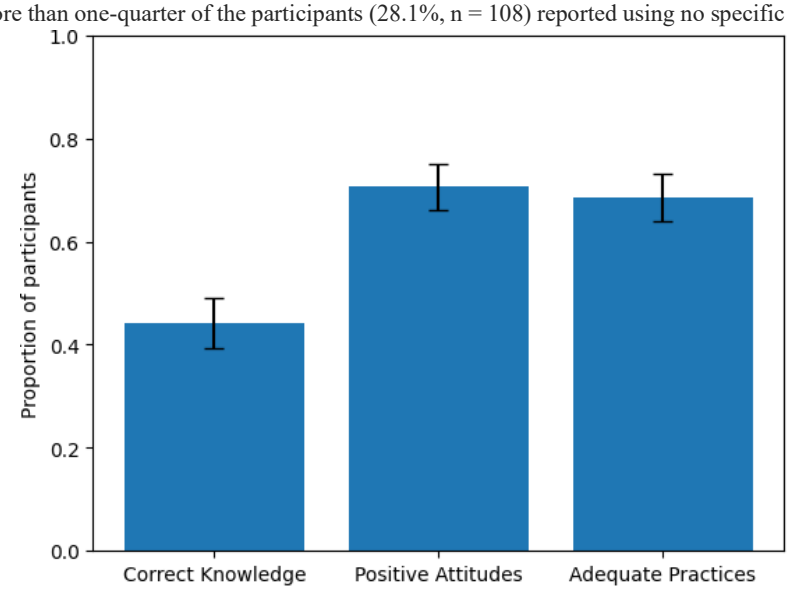

Figure 1 Gradient in Menstrual Health Domains Among Rural Schoolgirls (n=385)

The figure illustrates a pronounced gradient across the three core menstrual health domains, revealing an important and previously visualized interpretive insight. Correct biomedical knowledge regarding menstruation was observed in 44.2% of participants (95% CI: 39.3%–49.1%), substantially lower than the prevalence of positive attitudes toward menstrual hygiene, which reached 70.6% (95% CI: 66.1%–75.1%). Adequate self-reported menstrual hygiene practices were reported by 68.6% of participants (95% CI: 64.0%–73.2%), closely paralleling attitudes rather than knowledge. This divergence indicates that favorable hygienic behaviours and supportive attitudes are being maintained despite significant gaps in foundational understanding, suggesting that practice may be driven more by social norms, maternal guidance, or environmental cues than by formal biomedical knowledge. Clinically and programmatically, this pattern underscores a critical opportunity: strengthening accurate menstrual education could consolidate and sustain already positive practices, reduce persistent misconceptions, and improve long-term reproductive health outcomes without needing to first overcome negative behavioral norms.

DISCUSSION

This study provides a comprehensive assessment of menstrual knowledge, attitudes, and practices among school-going adolescent girls in rural areas of Lahore, Punjab, and reveals a consistent pattern of discordance between knowledge and behaviour. Although a majority of participants demonstrated supportive attitudes toward hygienic practices and reported relatively favourable menstrual hygiene behaviours, substantial gaps and misconceptions persisted in foundational knowledge regarding menstruation. Less than half of the respondents correctly identified menstruation as a normal physiological process, and misconceptions regarding its cause and the origin of menstrual blood were common. These findings reinforce earlier evidence from South Asia indicating that adolescent girls often practice menstrual hygiene without a clear biomedical understanding of menstruation, relying instead on social learning and informal guidance (4,6,13).

Preparedness at menarche was notably low, with fewer than one-quarter of participants reporting prior awareness before their first menstrual period. This lack of preparedness has been consistently documented in Pakistan and neighbouring contexts and is associated with fear, confusion, and negative emotional responses at menarche (15,19). In line with previous Pakistani studies, mothers were identified as the primary source of menstrual information, while teachers and formal educational channels played a minimal role (17,20). This reliance on maternal transmission of information may help explain the coexistence of supportive hygiene attitudes with persistent misconceptions, as maternal knowledge itself is often shaped by cultural beliefs and limited formal reproductive health education (11,18).

Despite these knowledge deficits, attitudes toward menstrual hygiene were largely aligned with evidence-based practices. A substantial majority of respondents recognized the importance of personal hygiene, clean water, soap use, and handwashing for the prevention of reproductive tract infections. This attitudinal profile mirrors findings from studies in Indonesia and India, where positive attitudes were observed even in settings with incomplete knowledge (12,13). The high rejection of the belief that menstruation is caused by disease further suggests that some stigma-related misconceptions may be weakening, potentially reflecting gradual normative shifts driven by increased exposure to hygiene messaging and peer normalization (10,14). Importantly, this attitudinal readiness represents a critical leverage point for interventions aimed at correcting misconceptions and strengthening informed practice.

Self-reported menstrual hygiene practices in this study were comparatively favourable when contrasted with several regional and international studies. The majority of participants reported using sanitary pads and changing absorbents at least twice daily, consistent with findings from parts of India but markedly higher than reports from some low-income African settings (21,22). Genital cleansing, hand hygiene, and appropriate disposal practices were widely reported, and most participants bathed during menstruation using water and soap. These behaviours align with recommended MHM practices and suggest that many girls are able to operationalize hygiene behaviours within their household environments

(7,9). However, the low prevalence of pad changing at school highlights a persistent structural barrier, likely related to inadequate school WASH facilities, lack of privacy, or absence of disposal mechanisms, as also reported in other low- and middle-income settings (1,5,24).

The gradient observed between knowledge, attitudes, and practices—where practices and attitudes substantially exceeded correct knowledge—has important clinical and programmatic implications. This pattern suggests that hygienic behaviours may be sustained through social norms, maternal instruction, or product availability rather than through formal understanding of menstrual physiology. While such behaviours may confer short-term health protection, the persistence of misconceptions may perpetuate stigma, limit autonomy, and hinder timely care-seeking for menstrual disorders (8,14). Moreover, reliance on incomplete knowledge may reduce resilience when girls encounter new contexts, such as secondary school environments or workplaces with different constraints (9).

The high prevalence of dysmenorrhea reported in this study is consistent with global and regional estimates among adolescents and underscores menstruation as not only a hygiene issue but also a pain-management and wellbeing concern (16,23). The substantial proportion of girls who used no intervention for menstrual pain highlights unmet needs for accessible, age-appropriate guidance on safe and effective pain management strategies. Integrating menstrual pain education into school health programs could therefore enhance both quality of life and school participation.

Taken together, these findings emphasize that improving menstrual health among school-going girls in rural Lahore requires more than the promotion of products or general hygiene messages. Interventions should prioritize structured, school-based menstrual health education that corrects misconceptions, prepares girls before menarche, and actively involves teachers alongside mothers. Concurrently, strengthening school WASH infrastructure—including reliable access to water, soap, privacy, and disposal facilities—is essential to enable girls to translate knowledge and attitudes into consistent practice within the school environment (5,10,24).

CONCLUSION

In conclusion, school-going adolescent girls in rural Lahore demonstrated generally positive attitudes and self-reported menstrual hygiene practices; however, these were accompanied by substantial gaps in basic menstrual knowledge and low preparedness at menarche. The coexistence of favorable behaviors with persistent misconceptions highlights a critical opportunity for targeted, school-based menstrual health education that builds on existing positive norms while correcting inaccurate beliefs. Strengthening teacher involvement, engaging mothers, and improving school WASH facilities are essential to support informed, dignified, and sustainable menstrual hygiene management and to promote adolescent reproductive health and educational participation.

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