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Adolescent Health and Menstrual Well-Being: Insights from School Students in West Bengal, India

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Abstract:

India has 253 million adolescents aged 10–19 years, representing nearly 21% of its population. The health and well-being of this group have a significant influence on the nation's morbidity, mortality, and demographic trends. Menstrual health remains a critical issue, as studies have reported that one in four schoolgirls in India miss classes during menstruation due to inadequate gender-sensitive toilets and limited access to sanitary products (Liverpool School of Tropical Medicine & UNICEF, 2014–15). This study aimed to examine menstrual health management practices and awareness among adolescent schoolgirls, while also assessing school-level water, sanitation, and hygiene (WASH) facilities in two districts of West Bengal, India. A cross-sectional survey was conducted in February 2025 among 160 students enrolled in classes IX and X in Jhargram and Purba Medinipur districts of West Bengal, India. Data were collected using a structured interview schedule. The majority of participants reported using sanitary napkins (70.2%), while 16% used cloth and 10% reported using menstrual cups. More than half of the respondents (51%) indicated the absence of sanitary pad vending machines in their schools, and 61% stated that they had never observed any sanitary product disposal facilities. Despite growing awareness and the gradual adoption of modern menstrual products, significant infrastructural gaps persist in school WASH facilities. Strengthening menstrual health management interventions at the school level is crucial for promoting adolescent health, educational continuity, and gender equity.

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Introduction:

Adolescents represent a critical demographic for public health, constituting nearly one-fifth of the global population and 21% of India's population, with 253 million individuals aged 10–19 years (UNICEF, 2023). Their health and well-being are pivotal determinants of a nation's long-term development, shaping morbidity, mortality, and demographic trends (WHO, 2021). Beyond physical health, adolescent development encompasses social, emotional, cognitive, and intellectual dimensions, requiring age-appropriate healthcare, life skills education, and supportive environments (WHO, 2022).

Globally, menstrual health management (MHM) has emerged as a pressing public health issue with direct implications for gender equity, school attendance, and adolescent empowerment (Sommer et al., 2016; Hennegan et al., 2022). Evidence shows that inadequate access to menstrual products, gender-sensitive sanitation facilities, and menstrual health education contributes to absenteeism, school dropout, and psychosocial stress among adolescent girls, particularly in low- and middle-income countries (Chandra-Mouli & Patel, 2017; van Eijk et al., 2019). In India, surveys reveal that nearly 25% of schoolgirls miss classes during menstruation due to insufficient WASH (water, sanitation, and hygiene) infrastructure and unavailability of sanitary pads (Liverpool School of Tropical Medicine & UNICEF, 2015).

School-based WASH facilities play an integral role in promoting adolescent health and educational outcomes. Availability of separate toilets for boys and girls, clean drinking water, handwashing stations with soap, and safe menstrual hygiene management (MHM) infrastructure reduces the spread of communicable diseases, enhances attendance, and supports inclusive learning environments (UNESCO, 2021; Caruso et al., 2021). Yet, recent reports from India indicate that nearly half of schools in both rural and urban areas continue to lack basic handwashing facilities, with significant deficits in menstrual product disposal and pad-vending mechanisms (Ministry of Education, Government of India, 2022).

The Government of India's vision document *Viksit Bharat 2047* emphasizes adolescent health as a cornerstone for achieving sustainable development, calling for improved access to healthcare, preventive programs, and awareness campaigns tailored to the unique developmental needs of this age group (NITI Aayog, 2023). Within this framework, menstrual health, sexual and reproductive health, mental well-being, and nutrition are prioritized, particularly for rural adolescents who face structural and cultural barriers to accessing services.

Against this backdrop, the present study investigates menstrual health management practices and awareness of overall health and hygiene among adolescent schoolgirls in Jhargram and Purba Medinipur districts of West Bengal, India. It also looks at how available and accessible WASH facilities are in schools, adding to what we know about health challenges faced by adolescents in schools with limited resources.

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Objectives of the Study:

This study aims to achieve the following objectives:

1. To examine menstrual health management practices among adolescent girls enrolled in secondary schools in Jhargram and Purba Medinipur districts, West Bengal, India.

2. To assess the level of awareness concerning overall health and well-being among secondary school students.

3. To investigate the availability and accessibility of water, sanitation, and hygiene (WASH) facilities offered by schools to students.

Methodology:

Study Design and Setting

This study used a cross-sectional survey in February 2025 in two districts of West Bengal, India: Jhargram and Purba Medinipur. In Purba Medinipur, Haldia Municipality and Nandigram-I block were chosen. In Jhargram, Sankrail block represented rural areas.

Sampling Strategy

To guarantee representation across various school contexts, a multistage stratified sampling technique was used. Eight secondary schools in all were purposefully included in the study from the chosen regions. A final sample size of 160 participants was obtained by randomly selecting 20 students from each of the 8 schools who were enrolled in classes IX and X.

Data Collection

The researchers created a structured interview schedule that was used to gather primary data. The tool contained questions about the availability of water, sanitation, and hygiene (WASH) facilities in schools, awareness of general health and well-being, and menstrual health management practices. Prior to data collection, the instrument was pre-tested on a small sample to ensure clarity and validity.

Secondary data were obtained from peer-reviewed research articles, government reports, newspaper publications, and official websites to complement and contextualize the findings.

Data Analysis

Collected data were coded and analyzed using descriptive statistics to summarize practices, awareness levels, and infrastructural facilities. Qualitative responses were thematically analyzed to capture nuanced insights into students' perceptions and experiences.

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Ethical Considerations

Written informed consent was secured from school authorities, and assent was obtained from all participating students. Anonymity and confidentiality of responses were strictly maintained.

Findings:

Socio-demographic Characteristics of the Study Population

Table 1 presents the demographic characteristics of the study participants. The majority of respondents were female students (59.4%), while male students accounted for 40.6%. The proportion of female respondents was relatively higher compared to the general school population. In terms of grade-level distribution, 53.1% of participants were enrolled in Class IX, while 46.9% were from Class X, ensuring balanced representation across both grades. Regarding place of residence, a larger proportion of students were from rural areas (62.5%) compared to urban areas (37.5%).

Table 1: Characteristics of the Study Population (N = 160)

Characteristics	Categories	Frequency (n)	Percentage (%)
Gender	Male	65	40.6
	Female	95	59.4
Class of Study	Class IX	85	53.1
	Class X	75	46.9
Area of Residence	Rural	100	62.5
	Urban	60	37.5

Age Distribution of Study Participants

Table 2 presents the age-wise distribution of respondents. The majority of participants were 15 years old (56.3%), reflecting the typical age for students enrolled in Class IX and X. A smaller proportion of students were aged 14 years (21.9%) and 16 years (21.3%). Only one participant (0.6%) was 17 years old, representing an older student in Class X. Overall, the distribution aligns with the expected age group for secondary-level education.

Table 2: Age-wise Distribution of Respondents (N = 160)

Age (years)	Frequency (n)	Percentage (%)
14	35	21.9
15	90	56.3
16	34	21.3
17	1	0.6

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Perceptions of Hygiene in Relation to Health

Table 3 summarizes the respondents' perceptions regarding the importance of maintaining hygiene for health. A large majority (93%) of students acknowledged that hygiene is essential for health. In contrast, only 1% of respondents disagreed, while 6% reported uncertainty, which may reflect limited awareness or difficulty in understanding the question. These findings highlight generally positive perceptions toward hygiene, though a small proportion of students require further health education interventions.

Table 3: Perceptions Regarding the Importance of Hygiene for Health (N = 160)

Perception Response	Frequency (n)	Percentage (%)
Important for health	149	93.1
Not important for health	2	1.3
Not sure/No response	9	5.6

Frequency of Doctor Visits for Health Check-ups

Table 4 illustrates the frequency of respondents' visits to doctors for health check-ups. The majority of students (77.5%) reported consulting a doctor only when they were ill, indicating a reactive rather than preventive approach to healthcare. In contrast, 11.3% of respondents visited a doctor once annually for routine check-ups, while smaller proportions reported visiting once every six months (6.3%) or once every three months (5%). These findings suggest that preventive healthcare practices remain limited among the study population.

Table 4: Frequency of Doctor Visits among Respondents (N = 160)

Frequency of Visit	Frequency (n)	Percentage (%)
Only when sick	124	77.5
Once a year (routine check)	18	11.3
Once in 6 months	10	6.3
Once in 3 months	8	5.0

Access to Healthcare Facilities

Table 5 presents respondents' access to proper healthcare facilities in their local areas. The majority of students (78.8%) reported not having adequate access to healthcare services, reflecting a major barrier to maintaining good health and well-being. Only 13.1% indicated that proper healthcare facilities were available to them, while 8.1% were uncertain about the presence or adequacy of such services. These findings highlight a substantial gap in healthcare accessibility for adolescents, particularly in semi-urban and rural regions.

Table 5: Access to Proper Healthcare Facilities Reported by Respondents (N = 160)

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Access to Healthcare Facilities	Frequency (n)	Percentage (%)
No access	126	78.8
Yes, have access	21	13.1
Not sure	13	8.1

Self-Reported Overall Health Status of Respondents

Table 6 presents students' self-assessment of their overall health status. The majority of respondents (61.3%) rated their health as "good," while 19.4% reported "excellent" health. In contrast, 17.5% described their health as "fair," and a small proportion (1.9%) considered their health "poor." Although most students perceived their health positively, nearly one-fifth of the respondents reported less-than-good health, indicating the need for targeted interventions to improve adolescent well-being. Maintaining strong health among school-aged adolescents is critical, as it directly influences attendance, learning outcomes, and overall psychosocial development.

Table 6: Self-Reported Overall Health Status of Respondents (N = 160)

Health Status	Frequency (n)	Percentage (%)
Excellent	31	19.4
Good	98	61.3
Fair	28	17.5
Poor	3	1.9

Frequency of Illness among Respondents

Table 7 shows the frequency of illness reported by students within a year. A large majority of respondents (76.9%) indicated that they rarely fall ill, suggesting a generally healthy adolescent population. However, 6.3% reported experiencing illness more than once per month, which may negatively affect school attendance and learning outcomes. Additionally, 8.1% of students reported falling ill once every three months, while 8.8% reported illness once every six months. These findings highlight that while most students maintain good health, a notable minority experience recurrent illness, which could have educational and developmental implications.

Table 7: Frequency of Illness Reported by Respondents in a Year (N = 160)

Frequency of Illness	Frequency (n)	Percentage (%)
Rarely fall ill	123	76.9
Once every 3 months	13	8.1
Once every 6 months	14	8.8
More than once a month	10	6.3

Guidance on Menstrual Hygiene Received at Home

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To assess the role of family in menstrual health education, respondents were asked whether they received guidance on menstrual hygiene at home. As presented in Table 8, approximately two-thirds of the students (65%) reported receiving such guidance from family members. However, 17% stated that they did not receive any menstrual hygiene information at home, while 18% were uncertain. These findings suggest that although families play an important role in shaping adolescents' menstrual health awareness, a considerable proportion of students lack consistent support at the household level.

Table 8: Guidance on Menstrual Hygiene Received at Home (N = 160)

Response	Frequency (n)	Percentage (%)
Yes	104	65.0
No	27	16.9
Not sure	29	18.1

Students' Perceptions of Menstrual Hygiene Assistance at School

Following the assessment of guidance received at home, the study also explored whether students received menstrual hygiene assistance from female teachers at school. As shown in Table 9, a majority of respondents (69.2%) reported that their female teachers provided support and guidance related to menstrual hygiene. In contrast, 17% indicated that they did not receive any such assistance, while 13.8% were uncertain. These results highlight the important role schools and teachers play in complementing family-based menstrual health education, though gaps in support remain.

Table 9: Students' Perceptions of Menstrual Hygiene Assistance from Teachers (N = 160)

Response	Frequency (n)	Percentage (%)
Yes	111	69.2
No	27	17.0
Not sure	22	13.8

Use of Menstrual Hygiene Products

Table 10 presents the distribution of respondents according to their use of menstrual hygiene products. The findings reveal that the majority of students (70.2%) reported using sanitary napkins during menstruation, indicating a relatively higher level of access to modern menstrual products. However, a notable proportion of respondents (16.0%) still relied on cloth, reflecting gaps in affordability, awareness, or availability. A smaller segment of participants (9.6%) reported using tampons or menstrual cups, while 4.3% stated that they did not use any specific product during their menstrual cycle.

The results indicate that not all respondents consistently use hygienic products. This highlights the urgent need for policy interventions such as the free distribution of sanitary pads in government schools, along with awareness campaigns on the importance of safe menstrual practices.

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Table 10: Use of Menstrual Hygiene Products among Respondents (N = 160)

Product Used	Frequency (n)	Percentage (%)
Sanitary napkins	113	70.2
Cloth	26	16.0
Tampons/Menstrual cups	15	9.6
None	7	4.3

Availability of Sanitary Napkin Vending Machines in Schools

To complement the analysis of menstrual hygiene product usage, the study further investigated the availability of sanitary napkin vending machines in schools. Table 11 indicates that 49% of respondents reported the availability of functional sanitary napkin vending machines in their schools, whereas 51% noted the absence of such facilities.

The absence of vending machines indicates a significant deficiency in the management of menstrual hygiene within schools. Providing access to sanitary pad vending machines for all students may reduce absenteeism, enhance equity in education, and enable girls to manage menstruation with dignity. Policymakers ought to integrate these machines into school health and hygiene initiatives.

Table 11: Availability of Sanitary Napkin Vending Machines at Schools (N = 160)

Category	Frequency (n)	Percentage (%)
Available	78	49.0
Not available	82	51.0

Availability of Sanitary Product Disposal Facilities in Schools

One essential element of menstrual hygiene management (MHM) is the safe disposal of menstrual products. To lessen contamination of water, air, and soil, the World Health Organization (WHO) suggests safer alternatives like incineration or deep burial (WHO, 2018). Students in the current study were asked if their schools had facilities for disposing of sanitary products.

The data in Table 12 indicate that the majority of respondents (61%) said they had never seen a disposal mechanism on their campuses, while only 39% said their schools had such facilities. Inadequate disposal facilities not only pose environmental risks but also contribute to stigma, absenteeism, and discomfort among teenage girls, underscoring the urgent need for intervention.

Table 12: Availability of Sanitary Product Disposal Facilities at Schools (N = 160)

Category	Frequency (n)	Percentage (%)
Available	62	39.0
Not available	98	61.0

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Status of Water, Sanitation, and Hygiene (WASH) Facilities in Schools

Promoting adolescent health, school attendance, and successful learning requires that schools have adequate Water, Sanitation, and Hygiene (WASH) facilities (Jasper et al., 2012; UNICEF, 2020). In the present study, students were asked about the availability and condition of WASH infrastructure in their schools.

As shown in Table 13, a majority of respondents (76.88%) reported access to clean drinking water, while 23.13% stated that such facilities were unavailable in their schools. Nearly all respondents (97.5%) confirmed the presence of separate toilets for boys and girls, although 2.5% noted their absence. However, the frequency of toilet cleaning raised concerns: only 15% reported daily cleaning, 35% weekly cleaning, while half (50%) indicated that toilets were rarely cleaned, suggesting underutilization due to poor maintenance.

With regard to hand hygiene, 53.75% of respondents mentioned the availability of soap and water near toilets, while 46.25% reported inconsistent or absent provision. This shortfall undermines proper hygiene practices and exposes students to avoidable health risks. Making sure that schools have enough WASH facilities is still an important step to protect students' health and cut down on absences, especially among teenage girls.

Table 13: Availability of WASH Facilities in Schools (N = 160)

WASH Facility	Response Category	Frequency (n)	Percentage (%)
Access to clean drinking water	Available	123	76.88
	Not available	37	23.13
Separate toilets for boys & girls	Available	156	97.50
	Not available	4	2.50
Toilet cleaning frequency	Daily	24	15.00
	Weekly	56	35.00
	Rarely	80	50.00
Handwashing with soap near toilets	Available	86	53.75
	Not available	74	46.25

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Discussion:

The present study elucidates significant insights regarding menstrual hygiene practices, health awareness, and WASH facilities among adolescent school students in the Jhargram and Purba Medinipur districts of West Bengal, India. The results indicate that despite a high level of awareness regarding the significance of hygiene, considerable infrastructural and behavioral deficiencies remain, especially concerning the availability of sanitary product disposal facilities, healthcare access, and the regular upkeep of school WASH infrastructure.

A predominant portion of respondents (70.21%) reported the use of sanitary napkins, reflecting a progressive transition towards contemporary menstrual hygiene products in alignment with national trends (Dasgupta & Sarkar, 2008; Kumar et al., 2019). However, the fact that 16% of respondents still use cloth and only a small number use menstrual cups or tampons reveals that there are still difficulties in affordability, accessibility, and societal and cultural perceptions. The absence of accessibility to no-cost or subsidized sanitary pads in schools may further exacerbate inequities, particularly among rural students, where financial constraints are more pronounced.

The lack of adequate disposal mechanisms in schools, reported by 61% of students, is consistent with earlier findings from other regions of India and low- and middle-income countries (LMICs), where inappropriate disposal practices contribute to environmental and health concerns (Mahon & Fernandes, 2010; van Eijk et al., 2016). Although the WHO recommends safe disposal methods such as incineration, their limited adoption at the school level reflects gaps in both infrastructure and policy implementation. Without adequate disposal systems, stigma and absenteeism linked to menstruation may persist, undermining educational attainment for adolescent girls.

The WASH findings underscore an uneven distribution of resources. While access to separate toilets for boys and girls was nearly universal (97.5%), only half of the respondents reported daily or weekly cleaning, and 46.25% reported an absence of soap near toilets. This indicates that the mere existence of infrastructure does not ensure efficient utilization—an issue similarly highlighted in extensive surveys like the Annual Status of Education Report (ASER, 2022) and UNICEF monitoring studies. International evidence indicates that operational and well-maintained WASH facilities in schools enhance attendance, mitigate infection risks, and foster dignity among students, particularly girls (UNICEF, 2020; Sommer et al., 2015).

Healthcare access also was detected to have some gaps as 78.75% of respondents indicated that they did not have access to proper healthcare facilities within their area of residence. This falls in line with available literature that demonstrates that rural populations in India lack access to health services that are friendly to adolescents (Patton et al., 2016). Low access to healthcare has a direct impact on the access to timely treatment, preventive check-ups, and spread of accurate information about reproductive and menstrual health.

Combined, the results highlight the multidimensional aspect of the challenges of adolescent health. Beyond providing sanitary products, schools must ensure comprehensive interventions, including awareness campaigns, teacher-led guidance, parental involvement, and the strengthening of school

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WASH infrastructure. Government programs such as the Rashtriya Kishor Swasthya Karyakram (RKSK) and Swachh Bharat: Swachh Vidyalaya have laid an important foundation, but implementation gaps remain at the grassroots level, particularly in rural West Bengal.

This study contributes to the growing body of evidence that menstrual health should be framed not only as a health issue but also as an educational and gender equity concern. Ensuring universal access to hygienic menstrual products, safe disposal mechanisms, and adolescent-friendly healthcare services will directly support India's broader developmental vision of *Viksit Bharat 2047*.

Major Findings:

Based on the analysis of primary data collected from adolescent school students in Jhargram and Purba Medinipur districts of West Bengal, India, the following key findings emerged:

1. **Awareness of Hygiene**
   - A significant majority (93%) of respondents recognized the importance of maintaining hygiene for health, indicating strong awareness among adolescents.
   - However, a small proportion (6%) expressed uncertainty, suggesting gaps in comprehensive health education.
2. **Healthcare Access and Utilization**
   - Most respondents (77.5%) reported visiting doctors only when sick, with very few seeking preventive or routine check-ups.
   - A substantial proportion (78.75%) lacked access to proper healthcare facilities in their locality, highlighting a major service delivery gap in rural areas.
3. **Self-Perception of Health**
   - While 61.25% rated their health as "good" and 19.38% as "excellent," nearly one-fifth (19.38%) reported their health as "fair" or "poor," reflecting disparities in health outcomes.
   - The majority (76.88%) rarely fell ill in a year, though a concerning minority (6.25%) reported frequent illnesses (more than once a month).
4. **Menstrual Hygiene Knowledge and Practices**
   - Around 65% of respondents received guidance on menstrual hygiene at home, while 69.15% acknowledged support from lady teachers at school.
   - Sanitary napkins were the most widely used menstrual product (70.21%), followed by cloth (16%) and menstrual cups/tampons (9.57%). However, 4.26% reported not using any specific product.
   - More than half of the respondents (51%) reported the absence of sanitary napkin vending machines in schools, and 61% reported a lack of disposal facilities, underscoring infrastructural gaps.
5. **School WASH Facilities**
   - Clean drinking water was available to 76.88% of respondents, but 23.13% reported its absence in their schools.

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- Nearly all students (97.5%) confirmed the availability of separate toilets for boys and girls. However, toilet cleaning was irregular, with 50% reporting "rarely" cleaned toilets.
- Only 53.75% of respondents reported the availability of soap and water near toilets, leaving 46.25% without proper handwashing facilities.

Recommendations:

Based on the study findings, the following recommendations are proposed to strengthen adolescent health, menstrual hygiene management, and WASH facilities in schools:

1. **Strengthening Menstrual Hygiene Management (MHM) in Schools**
   - Ensure free or subsidized distribution of sanitary napkins through schools, particularly targeting rural and low-income students.
   - Install and maintain sanitary napkin vending machines and disposal units (e.g., incinerators) in all schools to reduce absenteeism and ensure safe waste management.
   - Promote the use of eco-friendly alternatives (such as menstrual cups or biodegradable pads) through awareness programs and pilot initiatives.
2. **Improving WASH Infrastructure and Maintenance**
   - Guarantee access to clean and safe drinking water in every school, with routine monitoring and quality checks.
   - Strengthen toilet infrastructure by ensuring daily cleaning and regular maintenance of separate toilets for boys and girls.
   - Make handwashing with soap a mandatory facility by ensuring the regular supply of soap and water near school toilets, in alignment with hygiene standards.
3. **Enhancing Health Awareness and Preventive Care**
   - Incorporate structured, age-appropriate health and hygiene education into the school curriculum, with a focus on menstrual health, sexual and reproductive health, and nutrition.
   - Conduct periodic health check-ups for school students and encourage routine medical visits rather than treatment-only visits.
   - Train teachers, especially female teachers, to act as resource persons for menstrual hygiene education and emotional support.
4. **Parental and Community Engagement**
   - Promote discussion of menstrual hygiene and teenage health problems in the home environment to overcome the social taboos and promote the open sharing of information with parents.
   - Conduct school-community awareness activities to help promote safe menstrual practices, gender equity and stigma reduction.
5. **Policy and Programmatic Interventions**

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- Enhance the execution of government programmes like Rashtriya Kishor Swasthya Karyakram (RKSK) and Swachh Bharat: Swachh Vidyalaya and hold them accountable and monitored at local level.
- In the school development programs, assign certain budget lines to the menstrual hygiene management and WASH infrastructure.
- Prompt sustainable supply of waste disposal technology and sanitary products through public- private partnerships (PPP).

6. **Future Research**
    - Carry out bigger longitudinal research, to investigate the long run effects of menstrual hygiene on adolescent health and education.
    - Explore cultural and behavioral obstacles to the adoption of menstrual hygiene and evaluate school-based interventions.

Conclusion:

The present study sheds some important light on the behaviour of menstrual hygiene, health awareness and WASHES amongst adolescent school-going children in Jhargram and Purba Medinipur districts of West Bengal in India. Results indicate that although the majority of students are informed about the role of personal hygiene and report an overall good health condition, there still exist severe gaps in access to medical facilities, safe menstrual hygiene management and proper school facilities. The fact that a minority of students still use unhygienic menstrual products and the fact that many schools do not have sanitary pad vending machines and disposal units underscore the need to have critical interventions.

In the same manner, even though schools have ensured the separate facilities of toilets in most cases, inconsistent cleaning protocols, and absence of regular handwashing supplies threaten the health and learning conditions of students. These problems are even more problematic in rural settings, where there is still insufficient access to healthcare services.

Enhancement of adolescent health should be holistic and it involves the combination of menstrual hygiene management, preventive health care and Wash enhancement in the bigger context of adolescent health. Enhancement of health education in schools, mobilization of parents and communities and effective execution of government programs are critical in preventing absenteeism, early dropout, and empowering of the girl child.

In conclusion, the study emphasizes that investing in adolescent health and hygiene is not only a matter of equity but also a prerequisite for achieving sustainable development goals (SDGs) related to health, education, and gender equality. Addressing these gaps through evidence-based policies and community-driven initiatives will significantly contribute to nurturing a healthier, more empowered future generation.

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