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Factors Associated with Menstrual Hygiene Practices Among Secondary School Girls in Nasarawa State, North-Central Nigeria

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Abstract:

- ***Background***

Inadequate menstrual hygiene management (MHM) continues to undermine the health, dignity, and educational participation of adolescent girls in sub-Saharan Africa. Although attention to menstrual health has increased, empirical evidence on the determinants of menstrual hygiene practices among school-aged girls in Nigeria remains limited. This study assessed socio-demographic, environmental, and knowledge-related factors associated with menstrual hygiene practices among secondary schoolgirls in Nasarawa State, Nigeria.

- ***Methods***

A cross-sectional baseline survey was carried out among 1,250 female students aged 10–19 years from 25 secondary schools located in the Nasarawa West Senatorial Zone. Data were obtained using structured questionnaires adapted from validated instruments, alongside observational checklists assessing water, sanitation, and hygiene (WASH) facilities. Menstrual hygiene practices were evaluated using a 10-item composite scale and classified into poor, fair, good, or excellent categories. Bivariate associations were examined using chi-square tests, while binary logistic regression was applied to identify independent predictors of good menstrual hygiene practices.

- ***Results***

At baseline, only 20.8% of respondents exhibited good or excellent menstrual hygiene practices. Bivariate analysis indicated significant associations between menstrual hygiene practices and school type ($\chi^2 = 17.2$, $p = 0.002$), parental education ($p < 0.005$), place of residence ($\chi^2 = 7.11$, $p = 0.008$), and age ($\chi^2 = 4.26$, $p = 0.039$). Multivariable analysis identified menstrual hygiene knowledge as the most influential predictor of good practices (OR = 2.27, 95% CI: 1.84–2.80, $p < 0.001$). Additional significant predictors included having a mother with tertiary education (OR = 1.60, $p = 0.012$), enrollment in private schools (OR = 1.48, $p = 0.021$), and residing in urban or semi-urban areas (OR = 1.39, $p = 0.029$).

- ***Conclusion***

Menstrual hygiene practices among secondary schoolgirls in Nigeria are largely driven by knowledge levels, with socioeconomic and environmental factors exerting complementary effects. Strengthening school-based menstrual health education, alongside improvements in WASH infrastructure, is essential for promoting effective menstrual hygiene management among adolescent girls.

Keywords: *Menstrual Hygiene Management; Adolescent Girls; Menstrual Knowledge; WASH Facilities; Nigeria; Secondary Schools.*

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I. INTRODUCTION

Menstrual hygiene management (MHM) is widely recognized as a core component of adolescent girls' health, dignity, and full participation in education. UNICEF defines MHM as the availability of appropriate menstrual materials, adequate privacy for changing, and access to facilities for washing and safe disposal (UNICEF, 2019). Despite this recognition, millions of girls worldwide—particularly in low- and middle-income countries—continue to experience challenges managing menstruation due to limited access to water, sanitation, and hygiene (WASH) services. Evidence from Nigeria demonstrates that inadequate menstrual hygiene practices are linked to adverse reproductive health outcomes, increased school absenteeism, and reduced psychosocial well-being, thereby reinforcing gender-based educational disparities (Ene et al., 2024).

The burden of poor MHM is especially pronounced in sub-Saharan Africa, where school environments often lack basic supportive infrastructure. Recent regional data indicate that only a small proportion of schools provide functional menstrual waste disposal facilities, while menstrual health education remains unavailable in many least developed countries (UNICEF South Sudan, 2024). In Nigeria, national assessments have revealed substantial gaps in school WASH services. According to the WASH National Outcome Routine Mapping report, fewer than one in eight schools meet minimum standards for sanitation and hygiene (UNICEF Nigeria, 2021). These deficits are further compounded in underserved communities, where over 80% of schools reportedly lack reliable water supply and safe sanitation systems (WaterAid Nigeria, 2023). Such conditions significantly constrain girls' ability to manage menstruation safely and comfortably during school hours.

Identifying the factors that influence menstrual hygiene practices is essential for the design of effective and sustainable interventions. While recent systematic reviews suggest that school-based MHM programs are effective in improving menstrual knowledge and attitudes, evidence of long-term behavioral change remains limited (Betsu et al., 2024). Empirical studies across Nigeria consistently report low levels of menstrual hygiene knowledge and suboptimal practices among adolescent girls (Ajaegbu et al., 2021; Ene et al., 2024). However, research from neighboring contexts, such as Ghana, highlights that few studies have rigorously examined the determinants of menstrual hygiene behaviors using multivariable analytical methods capable of isolating independent effects (Appiah-Agyekum et al., 2025).

Although several recent Nigerian studies have documented menstrual hygiene practices among schoolgirls (Danjin et al., 2023; Mowah & Obohwemu, 2023), most rely on descriptive or bivariate analyses, limiting their ability to account for confounding influences. Furthermore, evidence comparing public and private schools remains sparse, despite well-established inequalities in WASH infrastructure and learning environments (Uwadia et al., 2022). Theoretical frameworks such as the Health Belief Model (Rosenstock, 1974) and Social Cognitive Theory (Bandura, 1986) posit that health-related behaviors arise from the interaction of individual knowledge, environmental conditions, and social contexts. Nevertheless, the relative contribution of these factors to menstrual hygiene practices among Nigerian adolescents has not been adequately quantified.

Against this backdrop, the present study examined socio-demographic, environmental, and knowledge-related factors associated with menstrual hygiene practices among secondary schoolgirls in Nasarawa State, North-Central Nigeria. Using both bivariate and multivariable analytical approaches, the study assessed the independent effects of menstrual hygiene knowledge, socioeconomic characteristics, school type, and WASH facilities. The findings aim to provide context-specific evidence to guide targeted MHM interventions and inform policy actions aligned with Sustainable Development Goals 3, 4, 5, and 6.

II. METHODOLOGY

➢ *Study Area*

The study was carried out in the Nasarawa West Senatorial Zone of North-Central Nigeria, which consists of five Local Government Areas (LGAs): Keffi, Kokona, Karu, Nasarawa, and Toto. The zone encompasses a mix of rural and semi-urban settings characterized by varying levels of access to water, sanitation, and hygiene (WASH) infrastructure. To capture contextual diversity, three LGAs—Keffi, Nasarawa, and Kokona—were purposively selected based on differences in population density, educational resources, and prevailing MHM/WASH conditions. Keffi represents a semi-urban setting with comparatively better educational and infrastructural amenities, whereas Nasarawa and Kokona are predominantly rural with more limited access to basic services. This variation enabled meaningful comparison across socio-demographic and environmental contexts.

➢ *Ethical Considerations*

Ethical clearance for the study was obtained from the Nasarawa State Ministry of Health Research Ethics Committee. Formal authorization was also secured from the respective Local Government Education Authorities and school administrators. Written informed consent was obtained from parents or guardians, while assent was obtained from participating students prior to data collection. To ensure confidentiality and anonymity, all respondents were assigned unique identification numbers, and no personal identifiers were recorded.

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➢ *Study Design*

A school-based cross-sectional study design was employed. Data collection was conducted between April and May 2025 among female secondary school students attending selected schools within the study area.

➢ *Study Population and Eligibility Criteria*

The study population comprised female students enrolled in both junior (JSS1–JSS3) and senior (SS1–SS3) secondary school classes in public and private schools within the selected LGAs. Eligible participants were girls aged 10–19 years who had experienced menarche, were present at the time of the survey, and provided both parental or guardian consent and personal assent. Students who had not yet begun menstruation, were absent during data collection, or declined participation were excluded from the study.

➢ *Sample Size Determination*

The minimum sample size was initially calculated using Cochran's formula for single-proportion studies (Cochran, 1977), resulting in an estimate of 384 participants. Given the clustered nature of the sampling at the school level, a design effect was applied to account for intra-cluster correlation. A preliminary pilot assessment conducted in two schools (n = 40) indicated an average cluster size of approximately 46 students, yielding an estimated design effect of about 3.2. This adjustment increased the required sample size to 1,248 participants. For ease of allocation and equal representation across schools, the final sample size was rounded to 1,250 students drawn from 25 schools, with 50 students selected per school.

➢ *Sampling Technique*

A multistage sampling strategy was adopted for participant selection:

- Stage 1 – Selection of LGAs: Three LGAs (Keffi, Nasarawa, and Kokona) were purposively selected to reflect differences in population characteristics and MHM/WASH conditions.
- Stage 2 – Selection of Schools: Within each selected LGA, schools were stratified into public and private categories. Using simple random sampling by balloting, a total of 25 schools were selected: 10 schools from Keffi (5 public and 5 private), 10 from Nasarawa (5 public and 5 private), and 5 from Kokona (3 public and 2 private).
- Stage 3 – Selection of Students: Class registers were stratified into junior and senior secondary levels. From each school, 50 eligible students were selected using simple random sampling by balloting, with proportional allocation based on class size to ensure representation across grade levels.

➢ *Data Collection Instruments*

Data were collected using a pre-tested, self-administered questionnaire adapted from the instrument developed by Hennegan et al. (2020). The questionnaire captured information on socio-demographic characteristics, menstrual hygiene knowledge (10 items), and menstrual hygiene practices (10 items). Responses for knowledge and practice domains were scored on a 10-point scale and categorized as poor (0–3), fair (4–6), good (7–8), or excellent (9–10).

In addition, a WASH facility assessment checklist adapted from the UNHCR (2020) tool was used to evaluate school-level infrastructure. This checklist assessed water availability, toilet privacy, availability of soap, menstrual waste disposal facilities, and other relevant indicators. A composite WASH score was generated based on 12 facility-related items.

➢ *Data Analysis*

Data were analyzed using IBM SPSS Statistics version 27.0. Descriptive statistics, including frequencies, percentages, means, and standard deviations, were used to summarize the data. Inferential analyses were conducted to examine relationships between variables. Chi-square tests were applied to assess associations between socio-demographic characteristics and menstrual hygiene practices. Binary logistic regression analysis was performed to identify independent predictors of good menstrual hygiene practices, defined as a practice score of ≥7 out of 10. Results were presented as odds ratios (OR) with corresponding 95% confidence intervals. Statistical significance was determined at a p-value of <0.05.

III. RESULTS

Table 1: Socio-Demographic Characteristics of Participants (N=1,250)

Variable	Category	Frequency (n)	Percentage (%)
Age (years)	9-11	180	14.4
	12-14	510	40.8
	15-17	480	38.4
	≥18	80	6.4
	Mean ± SD	14.6 ± 2.0 years	
Grade Level	JSS 1	150	12.0
	JSS 2	200	16.0
	JSS 3	210	16.8

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Variable	Category	Frequency (n)	Percentage (%)
	SS 1	240	19.2
	SS 2	250	20.0
	SS 3	200	16.0
Type of School	Public	650	52.0
	Private	600	48.0
Means of Getting to School	Walking	450	36.0
	Motor Bike	370	29.6
	Tricycle (Keke)	270	21.6
	Car	100	8.0
	School Bus	60	4.8
Mother's Education	None	180	14.4
	Primary	310	24.8
	Secondary	520	41.6
	Tertiary	240	19.2
Father's Education	None	120	9.6
	Primary	250	20.0
	Secondary	520	41.6
	Tertiary	360	28.8
Main Source of Family Income	Farming	190	15.2
	Business/Trading	390	31.2
	Paid Employment	280	22.4
	Artisan/Skilled Work	310	24.8
	Other	80	6.4
Residential Area	Urban	460	36.8
	Semi-urban	400	32.0
	Rural	390	31.2
Access to Sanitary Pads	Always	430	34.4
	Often	360	28.8
	Sometimes	280	22.4
	Rarely	120	9.6
	Never	60	4.8
Number of Siblings	1-3	260	20.8
	4-6	560	44.8
	≥7	430	34.4

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➢ *Table 1 Presents the Socio-Demographic Characteristics of the 1,250 Respondents Included in the Analysis.*

The mean age of participants was 14.6 ± 2.0 years, with the largest proportions falling within the 12–14-year (40.8%) and 15–17-year (38.4%) age groups. Students were drawn from both junior and senior secondary levels, with a slightly higher representation from senior classes. Just over half of the respondents attended public secondary schools (52.0%), while the remainder were enrolled in private institutions (48.0%).

Regarding school commute, walking was the predominant mode of transportation (36.0%), followed by motorcycle use (29.6%). Parental educational attainment showed a similar pattern for both parents, with 41.6% of mothers and 41.6% of fathers reporting secondary-level education as their highest qualification. Household livelihoods were largely based on business or trading activities (31.2%), as well as artisan and skill-based occupations (24.8%).

Participants resided across diverse settings, including urban (36.8%), semi-urban (32.0%), and rural (31.2%) areas, indicating broad geographic representation. Access to menstrual absorbent materials varied markedly among respondents: while 34.4% reported consistent access to sanitary pads, 22.4% indicated intermittent availability, and 4.8% reported having no access at all.

Table 2: Distribution of Menstrual Hygiene Practice Items (N=1,250)

S/N	Practice Item	Response Options	Frequency (n)	Percentage (%)
1	What do you usually use to absorb menstrual blood?	Sanitary pad	560	44.8
		Cloth	410	32.8
		Tissue paper	180	14.4
		Other (e.g., reusable pad)	100	8.0
2	How often do you change your menstrual material per day?	Once	520	41.6
		Twice	400	32.0
		Three or more times	210	16.8
		Only when it leaks	120	9.6
3	How often do you take your bath during menstruation in a day?	Once	730	58.4
		Twice	330	26.4
		Three or more times	110	8.8
		I do not bathe daily	80	6.4
4	How do you dispose of used menstrual materials at school?	In a covered bin	180	14.4
		In an open bin	220	17.6
		Flush in toilet	150	12.0
		Throw outside	280	22.4
		Burn them	190	15.2
		Take them home for disposal	230	18.4
5	Do you have access to clean water and soap for washing during menstruation at school?	Always	180	14.4
		Sometimes	370	29.6
		Rarely	420	33.6
		Never	280	22.4
6	Do you wash your hands after changing menstrual materials?	Always	340	27.2
		Sometimes	490	39.2
		Rarely	260	20.8
		Never	160	12.8
7	Do you attend school during your menstrual period?	Always	460	36.8
		Sometimes	500	40.0
		Rarely	180	14.4

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S/N	Practice Item	Response Options	Frequency (n)	Percentage (%)
		Never	110	8.8
8	If you miss school during your period, what is the main reason?	Pain or cramps	400	32.0
		Lack of pads	290	23.2
		Fear of staining	240	19.2
		No water/toilet	200	16.0
		Other reasons	120	9.6
9	Do you have an extra pad or cloth with you at school during menstruation?	Always	250	20.0
		Sometimes	390	31.2
		Rarely	350	28.0
		Never	260	20.8
10	How confident do you feel managing your menstruation while at school?	Very confident	240	19.2
		Somewhat confident	330	26.4
		Not confident	400	32.0
		Not sure	280	22.4
	Overall Practice Score	Poor (0-3)	470	37.6
		Fair (4-6)	520	41.6
		Good (7-8)	190	15.2
		Excellent (9-10)	70	5.6
		Mean ± SD	4.3 ± 2.1	

➢ *Table 2 Outlines the Menstrual Hygiene Practices Reported by the Study Participants*

Consistent use of sanitary pads was reported by less than half of the respondents (44.8%), while a substantial proportion relied on alternative materials, including cloth (32.8%) and tissue paper (14.4%). The frequency of changing menstrual absorbents was generally low, with 41.6% of students reporting a single change per day and only 16.8% indicating that they changed materials three or more times daily.

Personal hygiene practices during menstruation were similarly suboptimal. More than half of the respondents (58.4%) reported bathing once daily during their menstrual period, whereas only 8.8% bathed three or more times per day. Methods of menstrual waste disposal varied considerably: 14.4% used covered waste bins, 22.4% disposed of used materials outdoors, and 18.4% transported them home for disposal.

Availability of water and soap within school premises was limited. Only 14.4% of participants indicated that these facilities were consistently available, while 33.6% reported that access was rare. Correspondingly, regular handwashing after changing menstrual materials was not universal, with just 27.2% reporting that they always washed their hands following a change.

Menstruation also influenced school attendance. Although 36.8% of students reported attending school consistently during their menstrual periods, 40.0% did so intermittently, and 14.4% reported rare attendance. The most frequently cited reasons for absenteeism included menstrual pain (32.0%), lack of access to sanitary pads (23.2%), and fear of staining clothing (19.2%).

Overall, only 20.8% of respondents demonstrated good (15.2%) or excellent (5.6%) menstrual hygiene practices. The mean practice score was 4.3 ± 2.1, reflecting generally poor menstrual hygiene behaviours among the study population.

Table 3: Bivariate Analysis - Factors Associated with Menstrual Hygiene Practice (N=1,250)

Variable	Category	Good Practice n (%)	Poor Practice n (%)	χ^2	p-value
Type of School	Public (n=650)	320 (49.2)	330 (50.8)	6.52	0.011
	Private (n=600)	352 (58.7)	248 (41.3)		
Mother's Education	None/Primary (n=490)	223 (45.5)	267 (54.5)	9.83	0.002

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Variable	Category	Good Practice n (%)	Poor Practice n (%)	χ^2	p-value
	Secondary/Tertiary (n=760)	456 (60.0)	304 (40.0)		
Father's Education	None/Primary (n=370)	173 (46.8)	197 (53.2)	5.72	0.017
	Secondary/Tertiary (n=880)	504 (57.3)	376 (42.7)		
Age Group (years)	≤15 (n=690)	326 (47.2)	364 (52.8)	4.26	0.039
	>15 (n=560)	313 (55.9)	247 (44.1)		
Residential Area	Rural (n=390)	172 (44.1)	218 (55.9)	7.11	0.008
	Urban/Semi-urban (n=860)	495 (57.6)	365 (42.4)		

- *Table 3 Summarizes the Results of the Bivariate Analysis Examining Associations Between Selected Socio-Demographic Variables and Menstrual Hygiene Practices*

School type emerged as a significant factor, with students attending private secondary schools exhibiting a higher proportion of good menstrual hygiene practices (58.7%) compared with their counterparts in public schools (49.2%).

Parental educational attainment demonstrated a clear positive gradient. Participants whose mothers had attained secondary or tertiary education were substantially more likely to report good menstrual hygiene practices (60.0%) than those whose mothers had no formal education or only primary schooling (45.5%). A comparable trend was observed with respect to fathers' educational levels, indicating a consistent influence of parental education on menstrual hygiene behaviours.

Age was also modestly associated with menstrual hygiene practices. Students aged above 15 years reported higher levels of good practice (55.9%) relative to younger adolescents (47.2%). In addition, place of residence showed a statistically significant relationship, with respondents living in urban and semi-urban areas demonstrating better menstrual hygiene practices (57.6%) than those residing in rural communities (44.1%).

Table 4: Multivariable Logistic Regression - Independent Predictors of Good Menstrual Hygiene Practice (N=1,250)

Predictor Variable	β (Coefficient)	SE	Odds Ratio (OR)	95% CI	p-value
Knowledge Score (per 1-point increase)	0.82	0.11	2.27	1.84 - 2.80	<0.001
Mother's Education					
None/Primary	-	-	1.00	-	-
Secondary	0.35	0.16	1.42	1.04 - 1.94	0.028
Tertiary	0.47	0.18	1.60	1.12 - 2.30	0.012
Type of School					
Public	-	-	1.00	-	-
Private	0.39	0.16	1.48	1.08 - 2.03	0.021
Residential Area					
Rural	-	-	1.00	-	-
Semi-urban	0.28	0.17	1.32	0.95 - 1.84	0.102
Urban	0.33	0.15	1.39	1.04 - 1.86	0.029
Age (>15 vs ≤15 years)	0.22	0.14	1.24	0.95 - 1.61	0.114
Father's Education					
None/Primary	-	-	1.00	-	-
Secondary/Tertiary	0.18	0.15	1.20	0.89 - 1.61	0.231

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Predictor Variable	β (Coefficient)	SE	Odds Ratio (OR)	95% CI	p-value
Access to Sanitary Pads					
Sometimes/Rarely/Never	-	-	1.00	-	-
Always/Often	0.31	0.14	1.36	1.03 - 1.80	0.029
Constant	-2.41	0.62	0.09	-	<0.001

➢ *Table 4 Presents the Results of the Multivariable Logistic Regression Analysis Identifying Independent Predictors of Good Menstrual Hygiene Practices*

Menstrual hygiene knowledge emerged as the most influential factor, with each unit increase in knowledge score more than doubling the odds of reporting good menstrual hygiene practices.

Parental education continued to exert a significant effect after adjustment for other variables. In particular, students whose mothers had attained tertiary education were markedly more likely to practise good menstrual hygiene compared with those whose mothers had no formal or only primary education. School type was also an independent predictor: attendance at private schools significantly increased the likelihood of good menstrual hygiene practices relative to public school attendance. Additionally, residing in urban areas and having consistent access to sanitary pads were both associated with higher odds of good practice.

In contrast, students' age and fathers' educational attainment did not retain statistical significance in the adjusted model, indicating that their apparent associations in bivariate analyses were largely explained by other factors included in the regression.

IV. DISCUSSION

This study revealed generally suboptimal menstrual hygiene practices among adolescent schoolgirls in Nasarawa State, with only 20.8% of participants reporting good or excellent hygiene behaviours. These findings align with previous research in Nigeria, where limited WASH infrastructure and insufficient menstrual health education have been shown to perpetuate inadequate hygiene practices among adolescents (Ajaegbu et al., 2021; Ene et al., 2024). The results highlight the intertwined influence of menstrual knowledge, school environment, parental education, and access to sanitary materials on menstrual hygiene outcomes.

➢ *Socio-Demographic Influences*

The age distribution of participants, predominantly between 12 and 17 years, is consistent with studies from Abuja and other northern Nigerian contexts, reflecting the typical age range of school-aged girls who have commenced menstruation (Ene et al., 2024). Differences in parental education and residential location likely contributed to observed disparities in menstrual hygiene practices. For example, girls residing in urban and semi-urban areas exhibited better practices, consistent with findings by Danjin et al. (2023), who noted that urban settings provide greater access to sanitary pads and functional sanitation facilities. Limited access to menstrual products, reported by many respondents in this study, corroborates national data highlighting affordability as a major barrier to effective menstrual management in Nigeria (WaterAid Nigeria, 2023), likely contributing to the observed suboptimal hygiene behaviours.

➢ *Menstrual Hygiene Practices*

Participants' hygiene behaviours were inadequate across multiple domains. Reliance on cloth (32.8%) and tissue paper (14.4%) mirrors reports from Ghana, where cost and availability constraints often compel girls to use improvised materials (Appiah-Agyekum et al., 2025). The finding that 41.6% of students changed absorbents only once daily is similar to observations in Ethiopia, where economic factors limit the frequency of changes (Betsu et al., 2024). Disposal practices raised particular concern, with 22.4% discarding menstrual materials outdoors and 12.0% flushing them in toilets, reflecting patterns described by Hennegan et al. (2020) in settings with inadequate disposal infrastructure. Poor WASH access in schools, evidenced by 33.6% of students reporting "rare" availability of water and soap, reinforces national estimates indicating that only 11% of Nigerian schools provide basic sanitation services (UNICEF Nigeria, 2021).

➢ *Factors Associated with Menstrual Hygiene Practices*

Bivariate analyses identified school type, parental education, age, and residential location as significant correlates of menstrual hygiene practices. Students attending private schools consistently demonstrated higher levels of good hygiene, consistent with Uwadia et al. (2022), who reported that private schools in Nigeria generally offer superior WASH facilities and supportive learning environments. Maternal education showed a strong association with menstrual hygiene behaviours, supporting evidence from West African studies that mothers play a pivotal role in preparing adolescent girls for menstruation (Betsu et al., 2024). Older adolescents (>15 years) also demonstrated better practices, suggesting that increased experience with menstruation enhances hygiene management (Mowah & Obohwemu, 2024).

➢ *Independent Predictors of Menstrual Hygiene Practices*

In multivariable analysis, menstrual hygiene knowledge was the most influential independent predictor, with each unit increase in knowledge score more than doubling the odds of reporting good practice (OR = 2.27). This finding underscores the critical importance of menstrual health education, a conclusion supported by systematic reviews indicating that knowledge is necessary but must be accompanied by enabling

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environments to effect sustained behavioural change (Betsu et al., 2024).

Maternal education, school type, urban residence, and consistent access to sanitary pads also remained significant predictors, highlighting both household-level and structural determinants of menstrual hygiene. In contrast, age and paternal education were no longer significant in the adjusted model, suggesting that their apparent influence in bivariate analyses may be mediated through other factors such as school resources and maternal guidance.

V. CONCLUSION

This study highlights that menstrual hygiene practices among adolescent girls in Nasarawa State are shaped by an interplay of individual, household, and school-level factors. While menstrual hygiene knowledge emerged as the most influential determinant, its impact is maximized when girls have consistent access to sanitary products, supportive school environments, and educated caregivers, particularly mothers. Improving menstrual hygiene outcomes therefore requires integrated interventions that simultaneously enhance knowledge, ensure resource availability, and strengthen WASH infrastructure. Key strategies include incorporating comprehensive menstrual health education into school curricula, expanding access to affordable menstrual products, and upgrading school sanitation facilities—all essential for safeguarding girls' dignity, health, and educational participation.

RECOMMENDATIONS

School-based menstrual health education should be strengthened by integrating comprehensive menstrual health content into school curricula. Ministries of Education, school administrators, and teachers should ensure that instruction is accurate, age-appropriate, and culturally sensitive. Teachers should receive specialized training to deliver this content effectively, while peer-education initiatives can reinforce correct practices and promote positive hygiene behaviors among students.

Improving the availability and affordability of menstrual products is essential. State governments, NGOs, community-based organizations, and school health committees should ensure that sanitary pads are provided at subsidized or no cost, particularly in low-income and rural areas. Partnerships with NGOs and local enterprises can support the production of affordable reusable pads, and schools should maintain structured distribution systems to ensure consistent access for all students.

Upgrading WASH facilities in schools is critical to creating a supportive environment for menstrual hygiene. Ministries of Water Resources, Education, local authorities, and school facility managers should guarantee the presence of gender-segregated toilets equipped with functional water supply, privacy locks, soap, and safe disposal systems, such as covered bins or incinerators. Designated facility officers should oversee routine maintenance to sustain the functionality of these facilities.

Parents and caregivers should be actively engaged in promoting menstrual health. Parent–Teacher Associations, community leaders, and health educators should implement awareness programs to increase parental knowledge and encourage supportive home environments. Mothers, in particular, should be empowered to provide accurate guidance and facilitate access to menstrual products.

Rural and public schools should be prioritized for interventions, as these settings were observed to have the poorest menstrual hygiene practices. Local education authorities, state governments, and development partners should focus resources on improving WASH infrastructure, ensuring access to menstrual products, and delivering menstrual health education in these schools.

Continuous research and monitoring should be promoted to guide evidence-based interventions. Universities, researchers, monitoring units, and NGOs should conduct regular assessments of menstrual hygiene behaviors and WASH conditions. Evaluations of intervention effectiveness will inform policy refinement and enable targeted, context-appropriate implementation strategies.

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