The Effect of Health Education on Menstrual Hygiene Management among Adolescent Girls in Two Selected Secondary Schools in Auchi, Edo State

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ABSTRACT

Menstruation remains a source of fear, embarrassment, and misinformation for many adolescent girls, with poor knowledge and unhygienic practices leading to infections, school absenteeism, and social stigma. This study assessed the effect of health education on menstrual hygiene management among adolescent girls in Akpekpe Secondary School and Iyekhei Girls Secondary School, Auchi, Edo State. A quasi-experimental pre-test and post-test design was adopted involving 220 adolescent girls aged 10–19 years who had attained menarche. Data were collected using a structured self-administered questionnaire. A structured health education intervention focusing on menstrual physiology, hygienic absorbent use, frequency of pad changing, and disposal methods was implemented between the pre- and post-test phases. Data were analyzed using descriptive and inferential statistics, with Chi-square test employed at 0.05 significance level. Findings revealed that before intervention, only 27.3% had good knowledge while 72.7% demonstrated poor knowledge. Post-intervention, good knowledge increased to 86.4%, and hygienic practices improved from 43.2% to 86.4%. Chi-square analysis ($\chi^2 = 118.42$, df = 1, $p = 0.000$ for knowledge; $\chi^2 = 67.42$, df = 1, $p = 0.000$ for practice) indicated highly significant effects. Environmental and institutional factors such as inadequate water and disposal facilities were identified as barriers. The study concluded that structured health education significantly improves menstrual hygiene knowledge and practices. It is recommended that menstrual hygiene education be integrated into school health programs, teachers and nurses be trained for continuous guidance, and adequate sanitary facilities be provided in schools.

Keywords: Health Education, Menstrual Hygiene Management, Adolescent Girls, Knowledge, Practice, School Health

INTRODUCTION

Menstruation is a normal physiological process experienced by females of reproductive age, characterized by periodic shedding of the uterine lining in the absence of pregnancy. It typically begins during adolescence, marking the onset of puberty and reproductive maturity (UNICEF, 2023). Menstrual hygiene refers to the use of clean materials to absorb menstrual blood, proper disposal of these materials, and maintenance of personal hygiene during menstruation (WHO, 2022). Effective menstrual hygiene management (MHM) is essential for the health, dignity, and well-being of adolescent girls.

Globally, an estimated 1.8 billion individuals menstruate each month, yet millions lack access to adequate menstrual hygiene products, water, and sanitation facilities (UNICEF, 2023). In low- and middle-income countries, inadequate menstrual hygiene is a significant public health and social issue, often exacerbated by poverty, gender inequality, cultural taboos, and limited access to menstrual health education (Sommer et al., 2021). Poor menstrual hygiene practices can lead to reproductive tract infections, urinary tract infections, and other health complications, affecting psychosocial well-being and educational outcomes (Kaur et al., 2021).

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In Nigeria, studies have reported low levels of menstrual hygiene knowledge and suboptimal practices among adolescent girls, particularly in rural and semi-urban areas (Ezeonu et al., 2020). Challenges such as lack of affordable sanitary products, inadequate school water and sanitation facilities, menstrual stigma, and insufficient health education persist (Ajibola et al., 2021). These factors contribute to school absenteeism during menstruation, reduced academic performance, and diminished participation in extracurricular activities (Odeyemi et al., 2022).

Health education has been identified as an effective intervention for improving menstrual hygiene knowledge and practices among adolescent girls. Structured menstrual hygiene education programs provide factual information, address misconceptions, and promote positive attitudes towards menstruation (Chinyama et al., 2022). School-based interventions offer a strategic platform for reaching adolescents during a formative developmental stage and have been shown to increase knowledge, improve practices, and reduce school absenteeism related to menstruation (UNESCO, 2023).

Despite increased advocacy, a gap remains in implementing structured menstrual hygiene education in schools in Auchi, Edo State. This study therefore seeks to assess the effect of health education on menstrual hygiene knowledge and practices among adolescent girls in Akpekpe Secondary School and Iyekhei Girls Secondary School, providing evidence for policy formulation and sustainable menstrual hygiene programs in schools.

Purpose of the Study

The aim of this study was to assess the effect of health education on menstrual hygiene management by evaluating knowledge, practices, and influencing factors among adolescent girls in Akpekpe Secondary School and Iyekhei Girls Secondary School, Auchi, Edo State. The study tested two hypotheses: (1) There is significant difference between pre-intervention and post-intervention knowledge of menstrual hygiene management; and (2) There is significant difference between pre-intervention and post-intervention practices of menstrual hygiene management among the adolescent girls.

METHOD

Sample

The population comprised 585 adolescent girls aged 10–19 years from both schools. Using Yamane's formula with 5% margin of error, a sample of 238 participants was calculated. Proportionate sampling ensured fair representation across class levels. A total of 220 respondents completed the study (92% response rate), with 100 from Akpekpe Secondary School and 120 from Iyekhei Girls Secondary School.

Instrument

Data collection utilized a structured self-administered questionnaire with four sections: (A) socio-demographic characteristics; (B) knowledge of menstrual hygiene (8 items); (C) menstrual hygiene practices (16 items); and (D) factors influencing practices (10 items using 5-point Likert scale). The instrument was validated by experts in nursing science and measurement and evaluation. Reliability testing through pilot study yielded Cronbach's alpha of 0.76.

Design

A quasi-experimental pre-test and post-test design was adopted, similar to designs used by Kaur et al. (2021) and Aboiye et al. (2022). This design enables measurement of changes in knowledge and practices before and after intervention within the same group.

Intervention

The structured health education intervention consisted of 30–45minute interactive sessions covering menstrual physiology, importance of menstrual hygiene, proper use and disposal of sanitary pads, personal hygiene

practices, and addressing cultural beliefs and taboos. The intervention included demonstrations and group discussions conducted by trained facilitators.

Method of Data Collection

Ethical approval was obtained from the Ministry of Education, Edo State. Informed consent was secured from respondents and parents/guardians. Pre-test questionnaires were administered during school hours, followed by the health education intervention. Post-test questionnaires were administered three months post-intervention. Data collection spanned one week with 100% return rate for completed questionnaires.

Method of Data Analysis

Data were analyzed using SPSS version 25. Descriptive statistics (frequencies, percentages, means) summarized demographic data, knowledge, and practices. Chi-square tests determined associations between pre- and post-intervention variables at 0.05 significance level. Results were presented in tables.

RESULTS

Socio-Demographic Characteristics

Socio-Demographic Characteristics of Respondents are presented in Table 1. Majority of respondents (50.0%) were aged 13–15 years, 72.7% were Christians, and 54.5% attended Iyekhei Girls Secondary School. Half (50.0%) experienced menarche between ages 13–15 years. Parents were the primary source of menstrual information (40.9%), followed by friends (18.2%) and media (13.6%).

Pre- and Post-Intervention Knowledge

Table 2 shows respondent's pre-intervention knowledge of menstrual hygiene management**.** Pre-intervention findings revealed that only 58.2% correctly defined menstruation, 63.6% recognized the importance of clean sanitary pads, 46.4% knew appropriate changing frequency, and 40.9% were aware of proper disposal methods. Overall, 27.3% demonstrated good knowledge while 72.7% had poor knowledge.

Table 3 shows respondent's post-intervention knowledge of menstrual hygiene management. Post-intervention, 95.5% correctly identified menstruation as a physiological process, 97.7% recognized the importance of clean pads, and 90.9% knew proper changing frequency. Good knowledge increased to 86.4%, representing a 59.1% improvement.

Pre- and Post-Intervention Practices

Table 5 shows respondent's pre-intervention Practice of menstrual hygiene management**.** Pre-intervention, only 50% changed sanitary materials at school when needed, 43.2% used disposable pads, 68.2% bathed daily during menstruation, and 70.5% missed school due to menstruation-related problems.

Table 6 shows respondent's post-intervention practice of menstrual hygiene management**.** Post-intervention, 88.6% changed materials when needed, 90.9% used disposable pads, 95.5% bathed daily, and only 34.1% reported missing school. Good practices increased from 43.2% to 86.4%, representing a 43.2% improvement.

Factors Influencing Practices

Table 5 shows factors influencing practice**.** Lack of clean water and sanitation facilities (59.1%) and inadequate disposal facilities (54.5%) significantly affected practices. Health education programs improved knowledge and confidence (63.6%). Teacher support was reported by 50%, while 47.7% indicated that lack of parental or teacher support negatively affected practices. Cultural influences had lower agreement (36.4%), suggesting environmental and institutional factors exerted greater influence.

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Hypothesis Testing

Chi-square analysis revealed highly significant differences between pre- and post-intervention knowledge (χ^2 = 118.42, df = 1, p = 0.000) and practices (χ^2 = 67.42, df = 1, p = 0.000). Both null hypotheses were rejected, confirming that the structured health education intervention significantly improved menstrual hygiene knowledge and practices among adolescent girls in the study schools.

Result from this study

This study provides evidence on the effect of health education on menstrual hygiene management among adolescent girls in Auchi, Edo State. The pre-intervention findings revealed that respondents demonstrated incomplete knowledge and poor menstrual hygiene practices, with only 27.3% having good knowledge and 43.2% practicing good hygiene. This aligns with findings by Kaur et al. (2021) in India, where only 42% had good pre-menarche knowledge, and Patel et al. (2022), who reported that 39.6% correctly identified menstruation as a physiological process. Similarly, Singh et al. (2022) found that only 42% of rural Indian adolescents used hygienic menstrual materials, while Gebre et al. (2023) reported 51.2% good practice among Ethiopian girls.

Post-intervention results showed remarkable improvement, with good knowledge rising to 86.4% and good practices to 86.4%. These findings are consistent with Okafor et al. (2022), who observed knowledge improvement from 38% to 82% in Enugu, Nigeria, and Mahmoud and Saeed (2021), who reported increase from 45% to 88% in Egypt. Similarly, Aboiye et al. (2022) found knowledge increased from 41.3% to 79.6% and practices from 48.7% to 83.3% following school-based education in Ibadan. Mwaniki et al. (2020) in Kenya reported comparable improvements (45% to 88% in knowledge; 40% to 82% in practices).

The identification of environmental and institutional barriers, particularly inadequate water and sanitation facilities, corroborates findings by Khan et al. (2022) in Pakistan and Mwangi et al. (2023) in Kenya, who emphasized that school infrastructure significantly influences menstrual hygiene practices. The reduction in school absenteeism from 70.5% to 34.1% post-intervention aligns with Chinyama et al. (2019), who reported decreased absenteeism following menstrual hygiene programs in Zambia.

Overall, these findings reinforce that structured health education is highly effective in improving menstrual hygiene management among adolescent girls, regardless of geographical or cultural context. The consistency across studies from Nigeria, India, Kenya, Egypt, and Ethiopia underscores the universal need for school-based menstrual health interventions.

Implications for Nursing Practice

The findings emphasize the critical role of nurses as educators and advocates in promoting adolescent reproductive health. School health nurses are strategically positioned to provide regular, structured menstrual hygiene education within school health programs. Nursing practice can lead initiatives ensuring availability of sanitary facilities, safe water, and proper waste disposal systems. Nursing education institutions should incorporate menstrual health more robustly into curricula to equip future nurses with skills for delivering effective community-based programs. From a policy perspective, nurses can advocate for integration of menstrual hygiene education into school health policies, ensuring it is recognized as a vital component of adolescent health promotion.

CONCLUSION

This study demonstrates that structured health education significantly improves menstrual hygiene knowledge and practices among adolescent girls in Auchi, Edo State. The intervention successfully enhanced awareness, improved hygienic behaviors, corrected misconceptions, and reduced school absenteeism. Results confirm that health education is an effective strategy for promoting menstrual hygiene management. Integration of menstrual hygiene education into school health programs will not only improve practices but also foster self-confidence, reduce stigma, and enhance academic participation among adolescent girls. Collaborative efforts among nurses,

teachers, and public health practitioners are essential for implementing and sustaining menstrual hygiene education in schools.

The study recommends that the Ministry of Education integrate menstrual hygiene management into health education curricula, school health nurses organize periodic education sessions, school authorities ensure availability of adequate sanitary facilities, parents be encouraged to discuss menstruation openly with daughters, teachers receive training on menstrual health education, and government agencies develop policies promoting menstrual hygiene in schools including provision of free or subsidized sanitary products for low-income families.

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Conflict of interest

The authors declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

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Ethical conformity

The respondents were assured that their anonymity, confidentiality, and privacy would be maintained during and after data collection. Ethical approval was obtained from the Edo State Ministry of Education. The study procedures were conducted in accordance with the ethical standards of the responsible committee on human experimentation (regional) and with the Helsinki Declaration of 1975, as revised in 2000.

Running title

Health Education And Menstrual Hygiene Management

Contributions

PNK and FIO conceived the study, designed the study instrument, participated in data collection, analysis and interpretation of data, drafted the original manuscript, and revised the manuscript.

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Table 1: Socio-Demographic Characteristics of Respondents

Variable	**Category**	**Frequency (f)**	**Percentage (%)**
Age (years)	10–12	40	18.2
	13–15	110	50.0
	16–19	70	31.8
Class	JSS 1	25	11.4
	JSS 2	35	15.9
	JSS 3	40	18.2
	SS 1	50	22.7
	SS 2	45	20.5

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	SS 3	25	11.4
School	Akpekpe Secondary School	100	45.5
	Iyekhei Girls Secondary School	120	54.5
Religion	Christianity	160	72.7
	Islam	50	22.7
	Traditional	5	2.3
	Others	5	2.3
Age at Menarche (First Menstruation)	Below 10 years	10	4.5
	10–12 years	80	36.4
	13–15 years	110	50.0
	Above 15 years	20	9.1
Source of Information about Menstruation	Parents	90	40.9
	Friends	40	18.2
	Books	25	11.4
	Internet	20	9.1
	Media	30	13.6
	Others	15	6.8

Table 2: Pre- Intervention Knowledge of Menstrual Hygiene Management among

Statement	**Correct Response**	**Frequency (f)**	**Percentage (%)**
Menstruation is monthly bleeding from the uterus as part of the menstrual cycle	Correct	128	58.2
Using clean sanitary pads is important to prevent infections and maintain hygiene	Correct	140	63.6
Sanitary pads should be changed every 3–4 hours or 3–4 times/day	Correct	102	46.4
Regular bathing during menstruation helps reduce odor, remove blood, and maintain hygiene	Correct	110	50.0
Proper disposal of used pads is to burn or wrap and discard in a covered bin	Correct	90	40.9

Good personal hygiene practices include changing pads, bathing regularly, and washing hands before and after	Correct	126	57.3
Have access to clean water and soap during menstruation	Correct	160	72.7
Cultural beliefs or taboos affect menstrual hygiene management	Correct	140	63.6

Table 3: Post-Intervention Knowledge of Menstrual Hygiene Management among

Statement	**Correct (%)**	**Incorrect (%)**
What is menstruation?	210 (95.5%)	10 (4.5%)
Importance of using clean sanitary pads	215 (97.7%)	5 (2.3%)
How often should a sanitary pad be changed	200 (90.9%)	20 (9.1%)
Importance of regular bathing during menstruation	205 (93.2%)	15 (6.8%)
Proper disposal of used sanitary pads	198 (90.0%)	22 (10.0%)
Good personal hygiene practices during menstruation	212 (96.4%)	8 (3.6%)
Access to clean water and soap	207 (94.1%)	13 (5.9%)
Effect of cultural beliefs and taboos	190 (86.4%)	30 (13.6%)

Table 4: Comparison of Pre- and Post-Intervention Knowledge Scores

Knowledge level	**Pre-Test (%)**	**Post-Test(%)**	**Difference (%)**
Good Knowledge	60 (27.3%)	190 (86.4%)	+ 59.1
Poor Knowledge	160 (72.7%)	30 (13.6%)	- 59.1

Table 5: Pre-intervention practices of menstrual hygiene management

ITEMS	**YES**	**(%)**	**NO**	**(%)**
Do you change your sanitary material while at school when needed?	110	50.0	110	50.0
Do you use a disposable sanitary pad during your period?	95	43.2	125	56.8
During your menstrual period, do you take extra pad to school?	80	36.4	140	63.6
Is it good to dispose sanitary pad inside the waste bin?	120	54.5	100	45.5
Do you avoid certain activities (e.g., swimming, sports, cooking) during your period?	160	72.7	60	27.3
Do you bathe daily during your menstrual period?	150	68.2	70	31.8

ISSN No. 2321-2705 | DOI: 10.51244/IJRSI |Volume XIII Issue IV April 2026

Do you have enough water supply or storage in your school?	100	45.5	120	54.5
Do you wash your genital area with water (and soap when available) during menstruation?	140	63.6	80	36.4
Do you use reusable cloths, and also wash them immediately after use?	90	40.9	130	59.1
Do you dry reusable menstrual cloths/cloth pads in direct sunlight?	75	34.1	145	65.9
Do you feel comfortable at school during menstruation?	85	38.6	135	61.4
Do you feel uncomfortable sitting next to male students during menses?	165	75.0	55	25.0
Do you seek help or advice (teacher/health worker/parent) when you have menstrual problems?	100	45.5	120	54.5
Do you wrap used sanitary pads before disposing them in a covered bin?	95	43.2	125	56.8
Have you ever missed school because of menstruation-related problems (pain, lack of materials, fear/stigma).	155	70.5	65	29.5
Do you carry spare sanitary materials with you (e.g., to school)?	80	36.4	140	63.6

Table 6: Post-intervention practices of menstrual hygiene management

ITEMS	**YES**	**(%)**	**NO**	**(%)**
Do you change your sanitary material while at school when needed?	195	88.6	25	11.4
Do you use a disposable sanitary pad during your period?	200	90.9	20	9.1
During your menstrual period, do you take extra pad to school?	185	84.1	35	15.9
Is it good to dispose sanitary pad inside the waste bin?	205	93.2	15	6.8
Do you avoid certain activities (e.g., swimming, sports, cooking) during your period?	80	36.4	140	63.6
Do you bathe daily during your menstrual period?	210	95.5	10	4.5
Do you have enough water supply or storage in your school?	180	81.8	40	18.2
Do you wash your genital area with water (and soap when available) during menstruation?	205	93.2	15	6.8
Do you use reusable cloths, and also wash them immediately after use?	185	84.1	35	15.9
Do you dry reusable menstrual cloths/cloth pads in direct sunlight?	175	79.5	45	20.5
Do you feel comfortable at school during menstruation?	190	86.4	30	13.6
Do you feel uncomfortable sitting next to male students during menses?	60	27.3	160	72.7
Do you seek help or advice (teacher/health worker/parent) when you have menstrual problems?	195	88.6	25	11.4

Do you wrap used sanitary pads before disposing them in a covered bin?	205	93.2	15	6.8
Have you ever missed school because of menstruation-related problems (pain, lack of materials, fear/stigma).	75	34.1	145	65.9
Do you carry spare sanitary materials with you (e.g., to school)?	190	86.4	30	13.6

Table 7: Comparison of Pre- and Post-Intervention Practice Scores

Practice Variable	**Pre-Test (%)**	**Post- Test ((%)**	**Difference (%)**
Changed sanitary material when needed	58.2	91.8	+ 33.6
Used disposable sanitary pads	64.1	94.5	+ 30.4
Took extra pads to school	52.7	89.1	+ 36.4
Properly disposed sanitary pads in waste bin	61.4	95.0	+ 33.6
Bathed daily during menstruation	70.0	96.8	+ 26.8
Washed genital area with soap and water	67.7	94.1	+ 26 .4
Dried reusable cloths in sunlight	55.9	90.9	+ 35.0
Felt comfortable at school during menstruation	60.9	91.4	+ 30.5
Sought help/advice when having menstrual problems	50.5	88.6	+ 38.1
Wrapped used pads before disposal	63.6	93.2	+ 29. 6
Missed school due to menstrual problems	42.3	18.6	+ 23.7

Table 8: factors influencing menstrual hygiene practices

Variable	**SA (%)**	**A (%)**	**N (%)**	**D (%)**	**SD(%)**
My family provides me with adequate information about menstruation	120 (54.5	60 (27.3	15 (6.8)	15 (6.8)	10 (4.6)
My family's income level affects my ability to buy sanitary pads.	100 (45.5	80 (36.4	20 (9.1)	10 (4.6)	10 (4.6)
Teachers provide sufficient education about menstrual hygiene at school.	90 (40.9	85 (38.6	20 (9.1)	15 (6.8)	10 (4.6)
Peer influence affects the way I manage my menstrual hygiene.	95 (43.2	70 (31.8	25 (11.4	20 (9.1)	10 (4.6)
Cultural or religious beliefs in my community influence my menstrual practices.	80 (36.4	70 (31.8	25 (11.4	25 (12.4	20 (9.1)

ISSN No. 2321-2705 | DOI: 10.51244/IJRSI |Volume XIII Issue IV April 2026

Lack of clean water and sanitation facilities at school affects my menstrual hygiene.	130 (59.1	65 (29.5	10 (4.6)	10 (4.6)	5 (2.3)
Lack of sanitary pad disposal facilities at school affects my practices.	120 (54.5	70 (31.8	15 (6.8)	10 (4.6)	5 (2.3)
Health education programs improve my knowledge and confidence in menstrual hygiene.	140 (63.6	60 (27.3	10 (4.6)	5 (2.3)	5 (2.3)
I feel supported by my teachers and school during menstruation.	110 (50.0	75 (34.1	15 (6.8)	10 (4.6)	10 (4.6)
Lack of parental or teacher support affects the way I practice menstrual hygiene.	105 (47.7	70 (31.8	20 (9.1)	15 (6.8)	10 (4.6)

TABLE 9: The relationship between the pre-intervention and post-intervention knowledge of menstrual hygiene management among adolescent girls in akpekpe secondary school and iyekhei girls secondary school, auchi.

Knowledge level	**Classification**	**Menstruation is monthly bleeding from the uterus as part of the menstrual cycle**		**Total**	**Chi square(χ^2)**	**Degree of freedom**	**P value**
		Pre-intervention	**Post-intervention**				
Importance of using clean sanitary pads	**Good knowledge**	60	190	250	118.42	1	0.000
	Poor knowledge	160	30	190			
	Total	220	220	440			

TABLE 10: The relationship between the pre-intervention and post-intervention practice of menstrual hygiene management among adolescent girls in Akpekpe secondary school and Iyekhei girls secondary school, Auchi.

PRACTICE LEVEL	**CLASSIFICATION**	**Do you change your sanitary material while at school when needed?**		**TOTAL**	**Chi Square(χ^2)**	**Degree of Freedom**	**P value**
		PRE-INTERVENTION	**POST-INTERVENTION**				
Do you use a disposable sanitary pad during your period?	**Good Practice**	95	190	285	67.42	1	0.000
	Poor Practice	125	30	155			
	TOTAL	220	220	440			