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Assessment of Knowledge, Attitude and Practices of Menstrual Hygiene among Female Students in Federal University of Kashere, Gombe State, Nigeria.

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Abstract
This study aims to assess the knowledge, attitude and practices of female students in Federal University Kashere regarding menstrual hygiene to identify areas for improvement and inform the development of targeted educational programs. The specific objectives of this study are to determine the difference in the level of knowledge between adolescent and non-adolescent female students on menstrual hygiene, and to determine the difference of female students' menstrual hygiene practices with mothers' educational levels, correlation between attitudes toward menstrual hygiene to the socio-economic status of female students and menstrual hygiene practice. Four research questions were raised from the objectives and four hypotheses were hypothesized. A total of three hundred and seventy-two (372) female students of Federal University of Kashere were chosen as the sample for the research using convenience sampling method. A quantitative cross-sectional survey of 372 female students selected from Federal University of Kashere was conducted using a structured questionnaire; data were analysed with SPSS 23 using descriptive statistics, Mann-Whitney U test, and Spearman correlation. The findings of the research revealed that no difference in the level of knowledge between adolescents and adult female students of Federal University of Kashere. Similarly, there is no association between female students' menstrual hygiene and mother's level of education. More so, there is no correlation between attitudes toward menstrual hygiene to both the socio-economic status, and practice of menstrual hygiene among female students of Federal university of Kashere. Conclusively, there is 97% of the female students practice good menstrual hygiene, no difference in menstrual hygiene practices of female students and mothers' level of education, no correlation of attitude toward menstrual hygiene to both socioeconomic status and menstrual hygiene practice of female students of Federal University of Kashere.

Keywords: Knowledge, Attitude, Menstrual Hygiene Practice, and Female Students
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Introduction

Millions of women experience menstruation each month throughout the world. Accordingly, the onset of the menstrual cycle marks the beginning of the female's reproductive years and is a normal biological

process. Furthermore, it frequently signifies the passage from a young child to a fully developed adult lady in society. However, because of a lack of instruction on social issues, this common biological occurrence causes dread, bewilderment, humiliation, and discomfort in inexperienced girls in lower- and middle-income nations as they attempt to get used to their monthly period, (Meghana and Gomathy, 2021). According to Desta (2019), referenced in Siskawati (2022), adolescence is a time of psychological discovery in order to establish one's identity. As people grow from childhood to adolescence, they create abstract traits and self-concepts with their own standards and judgments, independent of how society compares them. More so, adolescents who have gone through menstruation should be aware of their bodies, reproductive organs, and any physical or psychological changes that may affect their health in order to ensure the safety of their reproductive organs. Numerous studies demonstrate that many females in low- and middle-income nations have difficulty and decency in managing their menstrual cycles and related cleanliness. In an emergency, this deprivation is significantly more severe for women and girls. These girls and women are unable to practice good menstrual health and hygiene at home, at school, at work, or in other public settings due to a combination of discriminatory social environments, false information, substandard facilities, and a limited selection of absorbent materials (UNICEF, 2019).

Public infrastructure and policies in the areas of health, water, sanitation, and hygiene (WASH), and education are also given low priority, along with inadequate resources for menstrual hygiene, support, and knowledge. Because of misconceptions and taboos, even the most fundamental information about menstruation is considered secret, which causes shame and exclusion for women and girls. Access to accessible water, WASH facilities, information and resources are among the obstacles that prevent women and girls with disabilities from managing their menstruation hygienically and with dignity, (UNICEF, 2019). Information about reproductive health issues; including menstruation is crucial for adolescent girls with the onset of menarche and the progression to womanhood. Lack of proper information about safe and hygienic menstrual practices for adolescent girls constitutes a huge knowledge gap and an unmet sexuality education need. This knowledge gap is also disproportionately spread among rural and urban locations. Generally, in developing countries, rural dwellers tend to be more disadvantaged in terms of access to health information compared with urban dwellers and the disparity in access to health information could also impact negatively impact on the access to needed information for improved menstrual hygiene management for rural dwellers, (Edet *et al*., 2020).

Attitudes that are related to menstrual hygiene (MH) are termed menstrual hygiene attitudes. Attitude is defined as mental and neutral state of readiness organized through experience, exerting a directive or dynamic influence upon the individual's responses to all objects and situations, which it relates. These attitudes can be positive or negative. Positive attitudes can enhance good health while negative attitudes can also lead to reproductive tract infections. It is therefore expected that the female students should have positive attitude with resultant positive practice, (Nkechi, 2021). There are many barriers school girls face regarding safe, hygienic, and dignified menstruation. These barriers contribute to gender discrimination in school environments and pervasive menstruation-related stigma, enabling behavioural restrictions and feelings of shame, stress, and taboo (Ene *et al*., 2024). Poverty and low education on reproductive health are two significant factors that affect the girls' knowledge and practice of menstruation and menstrual hygiene and their preparedness before experiencing menarche. This lack of knowledge on good menstrual hygiene practices further puts girls at risk of developing infections. Poor access to water, sanitation, and hygiene (WASH) facilities, in addition, leads to school absenteeism among school girls of menstruating age in low and middle-income countries such as Nigeria, (Odey *et al*., 2022). More so, menstruation is considered a taboo and humiliating topic that is rarely discussed publicly. As a result, most

adolescent females, particularly in developing countries, are unaware of the need for healthy MHM. Also, MHM is not adequately addressed in the curriculum of most secondary schools, and some girls may lack access to adequate menstrual hygiene facilities, (Ene *et al*., 2024).

Good menstrual hygiene is essential for all women's well-being, yet it is still a neglected issue in most parts of the world. In most traditional African cultures, menstruation is considered a taboo and humiliating topic that is rarely discussed publicly (Ene *et al*., 2024). Menstrual hygiene is a critical aspect of female students' health and well-being, thus the need to asses students in Federal University Kashere knowledge, attitudes, and engage in poor practices related to menstrual hygiene, leading to increased vulnerability to reproductive tract infections, school absenteeism, and decreased self-esteem (Ajaegbu *et al*., 2024). Thus, the need for an assessment of the current state of knowledge, and practices among female students in the university to inform the development of targeted educational interventions and promote healthy menstrual hygiene behaviors. This study aims to assess the knowledge, and practices of female students in Federal University Kashere regarding menstrual hygiene to identify areas for improvement and inform the development of targeted educational programs. The aim of this study is to determine the knowledge, and practices of menstrual hygiene among female students of Federal University Kashere, Gombe State, Nigeria. This will bridge limited data gap from Nigerian Universities especially North-East Nigeria. The specific objectives of this study are to determine the difference in the level of knowledge between adolescent and non-adolescent female students on menstrual hygiene, to determine the difference of female students' menstrual hygiene practices with mothers' educational levels, correlation between attitudes toward menstrual hygiene to the socio-economic status of female students and menstrual hygiene practice.

Materials and Methods

The study area is Federal University of Kashere (FUK). The university is located in Kashere village of Akko Local Government Area of Gombe State. The study will adopt a quantitative cross-sectional survey design with the aim of providing data on the target population. A cross-sectional design was chosen because it provides the opportunity to measure all the variables at the same time. More so, it does not permit a temporal relation between exposure and outcome. It allows control over the study population and measurements of several associations between variables at the same time. A non-probability sampling, which is convenience sampling method was employed to select participants that are readily available at the university health services department and are willing to take part in the research.

The dependent variable is measured on an 8-point scale using the Menstrual Hygiene Index by Selvi and Ramachandran, with 1 point for good practice and 0 for poor practice. The maximum points that could be achievable is 8. 1 to 3 points will be considered as poor, 4 to 8points as good. Knowledge of menstrual hygiene is measured on a 6 point scale using the Ajaegbu *et al*. (2021) scale. Correct answers attracted 1 point, while wrong answers attracted 0 points. The maximum points achievable is 6. 1 to 3 points was considered as low, while 4 to 6 points as high. Also on the level of education of the parents, no formal education is categorized as low level education, whereas primary, secondary and tertiary education are categorized as high level education. For attitude towards menstrual hygiene, Nautiyal *et al*. and Isono *et al*. questionnaire was adapted using the Likert Scale on a scale of 1 to 5. Strongly disagree = 1, Disagree = 2, Neutral = 3, Agree = 4, strongly agree = 5. Adolescents are classified people aged between 10 to 19 years old, but in university perspective, 16-19 years is adapted because the minimum age of entry into the university is 16 years.

The population of this study consists of the female students of the Federal University of Kashere, Gombe State, who are between 16 and 45 years old. The total population of the university is approximately 17,000 students, with 5346 female undergraduate students. The target population is all undergraduate female

students of the Federal University of Kashere who have attained menarche.

The sample size for the study will be 5346. This will be based on Taro Yamane's formula for sample size determination:

n = N / (1 + N [e] 2)

Where n = Sample size
N = Population
e = Error margin

The total target population is 5346 female students in Federal University of Kashere. The confidence interval will be 95% and 5% as margin of error.

That is; $5346 / (1+ 5346[0.05]^2)$
= 5346 /1+ (5346 x 0.0025)
=6500/ 1+ 13.365
= 6500 / 14.365
= ∼372

Therefore, the sample size is 372 at 5 % error margin. But it is further approximated to 372 to achieve mathematical convenience. A 10% non-response rate of 38 respondents made it 415 respondents.

That is 10% of 372 respondents:

= 10/100 x 372
= 0.1 x 372
= 37.2
= ∼ 37
Therefore, 372 + 37 = 409
= ∼ 410

The questionnaire is a structured questionnaire with closed and open-ended questions. It will be administered to the participants with the help female health personnel from Department of Health Services Department. Each questionnaire was double-checked for completeness before collection.

The instrument for data collection for this study is a structured questionnaire designed and tagged "Knowledge, Attitude, and Practices of Female Students on Menstrual Hygiene (KAP FSMH)." The questionnaire was divided into four (4) sections: sections A, B, C, and D. Section A addressed the demography of participants, while Section B addressed knowledge of menstrual hygiene, while Sections C and D addressed menstrual hygiene practices and attitudes toward menstrual hygiene, respectively.

A pilot study was carried out on students of Gombe State University. Questions difficult or ambiguous areas were resolved. A trial study was carried out using test re-test on forty-two (42) students of the Federal University of Kashere. The students used in the trial test will not be part of the sample for this research. The instrument developed was administered and re-administered at an interval of two (2) weeks. The data gathered was analyzed using Pearson Product Moment Correlation Coefficient Statistics for reliability test.

The instrument for this study was subjected to validation by the by Medical Doctor and Public Health Personnel from Health Services Department, Federal University of Kashere and a Senior Lecturer in the Department of English Language, Federal University of Kashere.

The questionnaire is a structured questionnaire with closed and open-ended questions. It will be administered to the participants with the help female health personnel from Department of Health Services Department. Each questionnaire was double-checked for completeness before collection.

Valid and treated copies of questionnaires were coded in Microsoft excel data and imported for analysis with International Business Machine (IBM) Statistical Package for the Social Science (SPSS) 23 which generated frequency distribution, mean, standard deviation, percentages (categorical and continuous data), and inferential statistics. Inferential statistics was used to measure formulated hypotheses. MAN-Whitney (U) Test of difference and Spearman Rank Coefficient of correlation test was used to determine the associations between the independent and dependent variables. The analyses were carried out at a significant level of alpha = 0.05.

A formal letter requesting authorization to conduct research and access to records of female students was written to the Federal University of Kashere's administration. Ethical approval was obtained from Gombe State Health Research Committee. (Reference number: MOH/ADM/621/V.1/1583). Participation in this research was voluntary and without prejudice as specified by the World Medical Association Declaration of

Helsinki Ethical principles. Informed consent was obtained from all participants in the study by appending their signatures. Participants were informed of their right to withdraw from the study at any time without consequence.

Results

Section A: (Demography)

Age of Respondents

A total of three hundred and seventy-two (372) Students were targeted from Federal University of Kashere Gombe state, Nigeria. Data collected showed that majority of the respondents were females as shown in the diagram.

Table 1shows the age of the respondents, it was found that One hundred and thirty one (191) were within the age range of 20 – 25 years accounting for 51.3% of the total respondents, followed by age range 16– 19 years (35.2%) with one hundred and thirty one respondents, age range 26 – 30 years (8.6%) with thirty two (32) respondents, 31-35 years (3.2%) with , age range 36 – 40 years (1.3%), while age range 41 – 45 years (0.3%) of the total respondents.

Table 1: Distributions of Respondents by Age

Variables (years)	Frequency (n)	Percentage (%)
16-19	131	35.2
20-25	191	51.3
26-30	32	8.6
31-35	12	3.2
36-40	5	1.3
41-45	1	0.3
Total	372	100.0

Age of the Respondent at Menarche

As seen in table 2, the study showed that in the University, female students who had their menarche between 8 – 10 years are forty-four (11.8%), between 11 – 13 years are one hundred and forty-three (38.2%), between 14 – 16 years are one hundred and thirty-five (36.3%) while those above 16 years are fifty-one only (13.2%).

Table 2: Age of Respondents at Menarche

Variables	Frequency	Percentage
8 – 10	44	11.8
11 – 13	142	38.2
14 – 16	135	36.3
Above 16	51	13.7
Total	372	100

Educational Qualifications of the Mothers' of the Respondents

Table 3 shows that majority 187 (50.3%) of the mothers of respondents' highest education qualification is tertiary, followed by Secondary education with 112 (30.1%), then primary education with 38 (10.2), and lastly the non-formal education with 35 (9.4) respondents.

Table 3: Mother's Highest Education Qualification

Variables	Frequency	Percent
Non- Formal	35	9.4
Primary	38	10.2
Secondary	112	30.1
Tertiary	187	50.3
Total	372	100.0

Ethnicity of the Respondents

Table 4 shows that 24.5% (91) of the respondents are Hausa/Fulani, followed by Yoruba 21.0% (78), Igbo 4.3% (16) while others account for 50.3% (187) of the respondents.

Table 4: Ethnicity of Respondents

Ethnicity	Frequency	Percent
Igbo	16	4.3
Hausa/Fulani	91	24.5
Yoruba	78	21.0
Others	187	50.3
Total	372	100.0

Religion of the Respondents

Table 5 shows that respondents that are adherents of Islamic religion are 155 (41.7%) while adherents of Christianity are 217 (58.3%).

Table 5: Religion of Respondents

Religion	Frequency	Percentage	Cumulative Percentage
Islam	155	41.7	41.7
Christianity	217	58.3	100.0
Total	372	100.0	

Socioeconomic Factors of the Respondents

In Table 6 above, the socio-economic classes of respondents are majorly the lower class whom constitutes about 110 (29.6%) of the total respondents, followed lower middle class whom are 101 (27.2%), middle class are (19.9%), upper middle class are 61 (16.4%), while Upper class are 26 (7.0%).

Table 6: Socio-Economic Classes of Respondents

Variables	Frequency	Percentage
Upper Middle Class	61	16.4
Lower Middle	101	27.2
Upper Class	26	7.0
Middle Class	74	19.9
Lower Class	110	29.6
Total	372	100.0

Sources of Menstrual Knowledge

In Figure 7, when asked from whom did you learn about menstruation. Those that acknowledged their mothers are 247 (66.4%), those that acknowledged their sisters are 46 (12.4%), those that acknowledged their friends are 20 (5.4%), and those that acknowledged their teachers are 59 (15.9%).

Table 7: When asked from whom did you learn about menstruation.

Variable	Frequency (n)	Percentage (%)
Mother	247	66.4
Sister	46	12.4
Friend	20	5.4
Teacher	59	15.9
Total	372	100.0

Water, Sanitation and Hygiene Facilities of Federal University of Kashere

Table 8 showed that majority (78.5%) of the female students agreed that there separate toilets and WASH facilities for females in their school, majority (77.4%) agreed that the toilets and WASH facilities have lockable doors, majority agreed that there are adequate

space in the toilets and WASH facilities, majority (62.9%) do not agreed that there are soaps for washing hands in the toilets and WASH facilities, majority (62.1%) agreed that there bins for sanitary pads disposal in the toilets and WASH facilities, majority (51.9%) agreed that the toilets are accessible to people with disabilities, majority (53.8%) agreed that the toilets and WASH facilities are always clean, and also majority (58.6%) agreed that there mirrors in the toilets and WASH facilities.

Table 8: Assessment of Water, Sanitation and Hygiene of Federal University of Kashere

WASH Facility		Frequency (n)	Percentage (%)
Are there separate toilets and WASH facilities for females in your school?	YES	292	78.5
	NO	80	21.5
	Total	372	100.0
Do the toilets and WASH facilities have lockable doors?	YES	288	77.4
	NO	84	22.6
	Total	372	100.0
Are there adequate space in the Toilets and WASH facilities?	YES	252	67.7
	NO	120	32.3
	Total	372	100.0
Are there soaps for washing hands in the Toilets and WASH facilities?	YES	138	37.1
	NO	234	62.9
	Total	372	100.0
Is there functional handwashing facilities in the Toilets and WASH facilities?	YES	138	37.1
	NO	234	62.9
	Total	372	100.0
Are there bins for sanitary pads disposal in the Toilets and WASH facilities?	YES	231	62.1
	NO	141	37.9
	Total	372	100.0
Are the Toilets and WASH facilities accessible to people with disabilities	YES	193	51.9
	NO	179	48.1
	Total	372	100.0
Are the Toilets and WASH facilities always clean?	YES	200	53.8
	NO	172	46.2
	Total	372	100.0
Are there mirrors in the Toilets and WASH facilities?	YES	154	41.4
	NO	218	58.6
	Total	372	100.0

Attitude of Menstrual hygiene Practice among Respondent

In table 9, when asked if a woman should feel embarrassed during her menses, 55.7% strongly disagreed, 29.3% disagree, 7.8% were neutral, 3.0% agreed while only 4.3% strongly agreed. When asked if menstruation connotes moral and spiritual uncleanliness, 35.5% strongly disagreed, 33.9% disagree, 9.1% were neutral, 16.1% agreed while only 5.4% strongly agreed. When asked if a woman cannot enter worship centre/ pray during menstruation, 37.6% strongly disagreed, 23.9% disagree, 7.0% were neutral, 21.8% agreed while only 9.7% strongly agreed. When asked if a woman should avoid classes/ social gatherings during menses, 46.5% strongly disagreed, 36.3% disagree, 6.5% were neutral, 8.1% agreed while only 2.7% strongly agreed. When asked if a woman cannot have normal daily activities during menses, 36.3% strongly disagreed, 33.1% disagree, 8.9% were neutral, 18.0% agreed while only 3.8% strongly agreed. When asked if a woman should be concern about body odour during menses, 12.4.7% strongly disagreed, 9.1% disagree, 3.0% were neutral, 51.3% agreed while only 24.3% strongly agreed. When asked if a woman need not to bath during

menstruation, 60.8% strongly disagreed, 20.2% disagree, 1.6% were neutral, 5.9% agreed while only 11.6% strongly agreed. When asked if a woman need not to cook during menstruation, 49.2% strongly disagreed, 30.6% disagree, 6.5% were neutral, 10.5% agreed while only 3.2% strongly agreed. When asked if a woman can avoid any foods during menstruation, 31.2% strongly disagreed, 33.3% disagree, 11.3% were neutral, 22.0% agreed while only 2.2% strongly agreed. When asked if a woman cannot sleep on same bed as others during menstruation, 56.7% strongly disagreed, 34.9% disagree, 4.0% were neutral, 4.0% agreed while only 0.3% strongly agreed. And lastly, when asked if a woman can have sexual intercourse during menstrual, 56.7% strongly disagreed, 20.2% disagree, 7.5% were neutral, 5.9% agreed while only 9.7% strongly agreed.

Table 9: Showing Attitude of Menstrual hygiene Practice among Female Students of Federal University of Kashere.

Variables	Category				
	Strongly disagree	Disagree	Neutral	Agree	Strongly Agree
A woman should feel embarrassed during her menses.	55.7%	29.3%	7.8%	3.0%	4.3%
Menstruation connotes moral and spiritual uncleanliness.	35.5%	33.9%	9.1%	16.1%	5.4%
A woman cannot enter worship centre /pray during menstruation.	37.6%	23.9%	7.0%	21.8%	9.7%
A woman can avoid classes/ social gathering during menses.	46.5%	36.3%	6.5%	8.1%	2.7%
A woman cannot have normal daily physical activities.	36.3%	33.1%	8.9%	18.0%	3.8%
A woman should be concern about body odour during menses.	12.4%	9.1%	3.0%	51.3%	24.3%
A woman need not to bath during menstruation.	60.8%	20.2%	1.6%	5.9%	11.6%
A woman need not to cook during menstruation.	49.2%	30.6%	6.5%	10.5%	3.2%
A woman can avoid any foods during menstruation.	31.2%	33.3%	11.3%	22.0%	2.2%
A woman cannot sleep on same bed as others during menstruation.	56.7%	34.9%	4.0%	4.0%	0.3%
A woman can have sexual intercourse during menstruation.	56.7%	20.2%	7.5%	5.9%	9.7%

SECTION B

Menstrual hygiene Practice among Female Students of Federal University of Kashere

Table 10, shows that majority of the female students 360 (97.0%) practice good menstrual hygiene, while 12 (3.0%) female students practice poor menstrual hygiene. Good practice was defined as a Menstrual Hygiene Index score of ≥4; using this cut-off, 360 (97.0%) of respondents were classified as having good practice.

Table 10: Showing Menstrual hygiene Practice among Female Students of Federal University of Kashere.

Variable	Frequency (n)	Percentage (%)
Good Menstrual Hygiene Practice	360	97
Poor Menstrual Hygiene Practice	12	3
Total	372	100

To determine the knowledge and practice of menstrual hygiene among female students of Federal University of Kashere; the values obtained from MAN-Whitney (U) Test of difference and Spearman Rank Coefficient of correlation were used to test the formulated hypotheses. The summary of test analyses is depicted in the tables below.

Man-Whitney (U) Test of Difference in the Level of Knowledge between Adolescent and Adult Female Students on Menstrual Hygiene

Table 11: Man-Whitney (U) Test of Difference in the Level of Knowledge between Adolescent and Adult Female Students on Menstrual Hygiene

Variable	N	Median	Mean Rank	Sum of Mean Rank	U- test	P. value	Remark
Adolescents	133	2.00	185.99	24736.50	15825.50	0.66	NS
Adults	240	2.00	187.56	45014.50			

Table 11 indicated that no significant difference exists between the menstrual hygiene knowledge level of adolescent and adult female students.

Spearman Rank Coefficient of Correlation between Female Students' Menstrual Hygiene Practices and Mothers' Educational Levels.

Table 12: Spearman Rank Coefficient of Correlation between Female Students' Menstrual Hygiene Practices and Mothers' Educational Levels.

Variable	N	Median	r. value	P. value	Remark
Menstrual Hygiene Practice	372	3.00	0.71	NS	
Mother's Educational Status	372	5.00			

Table 12, no significant relationship between the menstrual hygiene practices and mother's education level.

Spearman Rank Coefficient of Correlation between Attitudes and the Socio-Economic Status of Female Students on Menstrual Hygiene

Table 13: Spearman Rank Coefficient of Correlation between Attitudes and the Socio-Economic Status of Female Students on Menstrual Hygiene

Variable	N	Median	r. value	P. value	Remark
Attitudes	371	4.00	-0.092	0.75	NS
Socio-Economic	371	9.00			

Table 13, shows that no significant relationship between the attitudes and socio- economic status on menstrual hygiene.

Spearman Rank Coefficient of Correlation between the Attitude and Practice of Menstrual Hygiene among Female University Students.

Table 14: Spearman Rank Coefficient of Correlation between the Attitude and Practice of Menstrual Hygiene among Female University Students.

Variable	N	Median	r. value	P. value	Remark
Attitude	372	4.00	-0.03	0.55	NS
Menstrual Hygiene Practice	372	3.00			

Table 14 shows that no significant relationship between the attitude and practice of menstrual hygiene among university students

Discussion

The study revealed that there is no difference in the level of knowledge between adolescents and adult female students of Federal University of Kashere. This implied that the level of knowledge of menstrual hygiene between adolescent and adult students of Federal University of Kashere is the same.

This outcome is supported by Ahmad *et al*. (2021), Tamphasana *et al*. (2020), and Nautiyal *et al*. (2021) which shows majority of adolescents' females have good knowledge of menstrual hygiene. This implies that adolescent girls have as much knowledge as the adults. A possible explanation for the high prevalence of good practice could be as a result of selection bias (only enrolled university students), improved access to sanitary products, health education exposure or self-report bias.

However, the findings is in contrast with the research conducted by Yalew *et al*. (2021), reported that knowledge about menstrual hygiene was substantially correlated with bad menstrual hygiene behaviour, and that poor menstrual hygiene practice was quite prevalent. More so, Ibeagha (2022), concluded that students in Akinyele Local Government's public secondary schools lack sufficient understanding about menstruation hygiene, have a negative attitude about it, and do not practice it very effectively. This could be as a result of the fact their research is not within the university context, and the fact that female adolescent students have higher baseline of education and the availability of WASH facilities in the university as compare to other higher education institutions.

The outcome of the study also revealed that that no association between female students' menstrual hygiene practices and mother's education level. This finding contradicts Surana *et al*. (2020). noted that the education of the mother showed a trend with poor menstrual hygiene practices. However, if contextual differences are exploit like mothers who have university against mothers who secondary education, or mothers who live in rural against mothers who live urban could moderate the effect. More so it contradicts Sonowal *et al.* (2021), whom in their study show that mothers of high-school girls who had primary, secondary, or college education were 3.72, 8.54, and 6.78 times more likely to have good menstrual hygiene practices. However, this study supports the study of Ahmad *et al.* (2021),where they mentioned that the type of family, education of mother, and socioeconomic status have no significant association with knowledge regarding menstrual hygiene practice.

Finding of the study revealed that there was no correlation between attitudes and the socio-economic status of female students on menstrual hygiene. This implied that the socio-economic status of the female students of Federal University of Kashere has no effect on attitude toward the menstrual hygiene practice of the students. This could be as a result of access to sanitary materials, higher education status or the context of the study (University settings not secondary schools), health education awareness or self-report bias. This finding is in contrast with Surana *et al*. (2020), who mentioned that the education of the mother and the family's socioeconomic status showed a trend with poor menstrual hygiene practices.

Again, the study discovered that no relationship between the attitude and practice of menstrual hygiene among female students of Federal university of Kashere. This implies that students' attitude towards menstrual hygiene have no influence on menstrual hygiene practices. A possible explanation to this could be access to sanitary materials, higher education status of the participants or the context of the study (University settings not secondary schools), health education awareness or self-report bias. The findings of Nautiyal *et al* (2021) contradicts this finding where it indicates a positive attitude with 66.33 % of girls have good practices overall during menstruation. However, Ibeagha (2022) in her findings; there is no significant relationship between attitude and practice of menstrual hygiene among secondary school students in Akinyele Local Government area.

Conclusion

This study found no significant difference in menstrual hygiene knowledge between adolescent and adult female students and no significant association between mothers' education and menstrual hygiene practice. Overall, the vast majority of students reported good menstrual hygiene practices. These findings suggest that, within this university setting, factors other than age and maternal education may play a stronger role in shaping menstrual hygiene behaviours hygiene

practice is good irrespective of their mothers' educational background.

More so, finding show that no significant relationship between the attitudes and socio-economic status on menstrual hygiene, and that no significant relationship between the attitude and practice of menstrual hygiene among university students. These findings suggest that, within this university setting, factors other than socioeconomic status affect attitude toward menstrual hygiene. Lastly, it shows that other variables influence menstrual hygiene other than attitude. Conclusively, greater skill-based health education and more participation in menstrual hygiene from parents, the school system, and society may have positive influence on menstrual.

Recommendations

The following recommendations are necessary based on these research findings:

1. To assess the impact of include hygiene, sanitation, and menstrual health education in university curricula on students' long-term knowledge, attitudes, and practices, future research should use longitudinal or intervention-based approaches. Such research would assist in determining if curriculum-based interventions result in long-term gains in female students' management of menstrual hygiene and WASH-related behaviours.
2. The institutional, budgetary, and managerial obstacles to the provision of sustainable WASH services in Nigerian universities such as the availability of hygiene supplies, the upkeep of sanitary facilities, and the dependability of water supplies should be investigated further. Deeper understanding of the issues influencing the implementation and sustainability of WASH facilities and services might be possible through qualitative or mixed-methods research including university officials, facility managers, and students.

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