Rwanda Medical Journal RMJ

ORIGINAL ARTICLE Open Access

Determinants of menstrual hygiene practices among in-school adolescent girls in Osun State, Nigeria: a comparative descriptive cross-sectional study

Authors: T. I. Akinreni[1,*]; O. B. Okunloye[1]

Affiliations: *[1]Department of Community Medicine, Osun State University, Osogbo (Main Campus), Osun State, Nigeria.*

ABSTRACT

INTRODUCTION: Adolescence in girls has been recognized as a special period that signifies the transition from girlhood to womanhood. This study was conducted to assess the determinants of menstrual hygiene practices among in-school adolescent girls in private and public secondary schools in Osun State, Nigeria.

METHODS: A descriptive, cross-sectional study (comparative) involving 650 in-school secondary students (public and private), were selected via multistage stratified sampling technique, using a self-administered structured questionnaire. Relevant data was collected via a semi-structured questionnaire and analyzed using SPSS 23.0. Appropriate univariate analysis using frequency tables and charts, while bivariate analysis was done using a chi-square table. Multivariate analysis was done using logistics regression.

RESULTS: The modal age range was middle adolescence (14-16 years old). There was a statistically significant difference between public and private school respondents in terms of age menarche: More students in private schools (81.8%) had their menarche before the age of 13 compared to those in public schools (73.2%). More respondents in private secondary schools (67.1%) have good menstrual hygiene practices compared to their counterparts (55.4%). Almost all the respondents in public secondary schools and private secondary schools have good management on menstruation Multivariate analysis, more of the respondents in junior classes among public school respondents were approximately two times less likely (1/0.506 = 1.97) to have good hygiene practice compared to their counterparts.

CONCLUSION: Based on the findings in this study, it could be concluded that more of the respondents in private secondary schools had good hygiene practices compared to their counterparts. Hence, the need for all stakeholders to intensify efforts to provide accurate and adequate information as well as enable the environment to promote menstrual hygiene practices among in-school adolescent girls.

Keywords: Menstruation, Adolescent, Determinants, School

***Corresponding author:** Akinreni, Temidayo Ifeoluwa, Department of Community Medicine, Osun State University, Osogbo (Main Campus), Osun State, Nigeria, Tel: +2347067019741, Email- akinrenitemidayo@gmail.com; **Potential Conflicts of Interest (CoI):** All authors: no potential conflicts of interest disclosed; **Funding:** All authors: no funding has been sought or gained for this project; **Academic Integrity.** All authors confirm that they have made substantial academic contributions to this manuscript as defined by the ICMJE; **Ethics of human subject participation:** The study was approved by the local Institutional Review Board. Informed consent was sought and gained where applicable; **Originality:** All authors: this manuscript is original has not been published elsewhere; **Review:** This manuscript was peer-reviewed by three reviewers in a double-blind review process; **Type-editor:** Emilia (USA).

Received: 14th July 2021; **Initial decision given:** 08th February 2022; **Revised manuscript received:** 19th May 2022; **Accepted:** 29th July 2022.
 Publisher: Rwanda Biomedical Centre (RBC)/Rwanda Health Communication Center, P. O. Box 4586, Kigali. ISSN: 2079-097X (print); 2410-8626 (online)

Citation for this article: T. I. Akinreni; O. B. Okunloye. Determinants of menstrual hygiene practices among in-school adolescent girls in Osun State, Nigeria- a comparative descriptive cross-sectional study. Rwanda Medical Journal, Vol. 79, no. 3, p. 23-30, 2022. https://dx.doi.org/10.4314/rmj.v79i3.3

INTRODUCTION

Adolescence in girls has been recognized as a special period that signifies the transition from girlhood to womanhood [1]. It is a stage of human development that is characterized by physical, psychological, mental, and social changes that are critical to wellbeing [2]. There is an appearance of secondary sexual characteristics during adolescence; in girls, menstruation is one of these major characteristics, with the onset of menstruation, representing a landmark event in the pubertal development of adolescent girls [3]. From menarche onwards until menopause, reproductive health and menstrual hygiene are important aspects in the lives of females [4]. There is, however, not much attention paid to adolescent girls' specific health needs, notwithstanding that doing so would lay a good foundation for their physical and mental wellbeing, and their ability to cope with the heavy demands of reproductive health later in life [5].

Menstrual hygiene management by women and girls, is an important aspect of reproductive health, which, if not handled appropriately, can cause infections of the urinary tract, pelvic inflammatory disease, and vaginal thrush [6]. Menstrual hygiene practices may depend on the family's educational, socioeconomic, and cultural status. Poor menstrual hygiene causes a great impact on increased vulnerability to reproductive tract infections (RTI) [7].

Currently, millions of adolescent girls suffer from RTI and infections due to poor menstrual hygiene practices. Adolescents with adequate knowledge regarding menstrual hygiene are less vulnerable to RTI and its consequences [8]. In the same vein, many students suffer from shame due to blood stains in school, which results in an increased rate of dropouts in schools amongst adolescent girls. From previous literature, it was evident that the lack of menstrual hygiene in many countries in Africa and Asia is observed as an imperative problem. An environment where these hygienic needs are met can lead to enhanced self-esteem and attendance, thus improving girls' education and, subsequently, the development of a country [9].

Study objectives: To date, there is a paucity of data available on the determinants of menstrual hygiene among in-school students. Against this backdrop, this study aimed at assessing the determinants of menstrual hygiene practices among in-school adolescent girls in Osun State, Nigeria. Findings from the study could serve as a baseline from which interventions can be organized and also for future reference. Additionally, results from this study will add value to scientific knowledge and provide a platform for future interventions on menstrual hygiene among in-school students.

METHODS

Design: This comparative, descriptive, cross-sectional study was conducted amongst in-school adolescent students in public and private secondary schools within Osun State, Nigeria, between July to October 2020.

The formula for comparing two independent proportions was used to determine the sample size. Prevalence estimates of sample size were calculated based on the findings from a similar study which showed a good knowledge prevalence of 35% in private schools, assuming an 8% difference for public school students [2]. Using a 95% confidence level and a 5% margin of error, the required minimum sample size was 300 per group. Participants were selected using a multi-stage sampling technique. In the first stage, from the list of secondary schools in Osogbo, Osun State, 2 local governments were chosen by simple random sampling. Then the list of all registered secondary schools (both public and private) in the selected LGAs was obtained from the Ministry of Education. Three private and three public secondary schools in each of the selected LGAs were selected by simple random sampling via balloting technique, making a total of 6 schools. The desired sample size was selected using stratified random sampling with a proportional allocation of respondents from the different classes in the selected secondary schools; stratification was along the line of classes (JSS 2 to SS 3).

Data collection tool: The researchers designed a semi-structured questionnaire specifically for use in this study. The tool was a self-administered questionnaire divided into three sections: A, B, and C, with each part comprising of items related to the students' socio-demographic variables, knowledge of menstruation and hygiene practices. The questionnaire was closed-ended and subjected to face and content validity. The items in each part were scrutinized and matched with the

predetermined objectives. A pre-test was done to enable the researchers to determine the ease of application of the instrument, the appropriateness of questions and the time of completion. The data were collected physically while students were in a classroom while adhering to the COVID-19 protocol of face-masks and social distancing.

Data analysis: The data was analyzed using SPSS 23.0, and appropriate univariate analysis was undertaken using simple percentages and frequency tables and charts. Bi-variate analyses were undertaken to identify associations between two categorical variables presented in tables. Multivariate analysis was done using logistic regression to analyze the relationship between determinant variables further. The outcome measure was categorized using the correct answer for knowledge and hygiene practice as 1 and incorrect answers were grouped 2. All the questions were recoded and computed; scores below the mean were recoded as "good," while the scores above the mean were grouped as "poor".

Ethical approval was obtained from the Health Research Ethics Committees (HREC), Osun state university, Osogbo with the ethical number HREC/OSU/COM/2019/005. Permission to conduct the study was also obtained through the permanent secretary of Osun State Ministry of Education to the Head of the schools that were involved in this study. Additionally, participants' consent was sought as well as that of their parents to cover those below 18 years. They were assured of strict anonymity as their name or address were not collected nor extracted and confidentiality, as the data collected, is only meant for research purposes. All the ethical protocols were observed before proceeding with the data collection.

RESULTS

A total of 650 respondents, between the age of 14-16 (mid-adolescence) filled the questionnaire, of which 71.7% were students from public schools and 68.0% from private schools. With regards to class, more of the respondents are in senior classes both in private and public schools 254 (78.2) and 248

Table 1: Socio-demographic characteristics of respondents in public and private schools (n=650)

	PUBLIC n=325 (%)	PRIVATE n=325 (%)	TOTAL N=650 (%)	INDICES
Age Group: Mean =15 SD= 1.43, Min= 11 years Max =19 years				
Early adolescence (11-13 years)	35 (10.8)	83 (25.5)	118 (18.2)	χ^2 = 36.458
Middle adolescence (14-16years)	233 (71.7)	221 (68)	454 (69.8)	df=2
Late adolescence (17-19years)	57 (17.5)	21 (6.5)	78 (12)	p<0.001
Class				
Junior class	77 (23.7)	71 (21.8)	148 (22.8)	χ^2 = 0.315
Senior class	248 (76.3)	254 (78.2)	502 (77.2)	df=1
				p=0.575
Religion				
Christian	181 (55.7)	217 (66.8)	398 (61.2)	χ^2 =11.385
Islam	140 (43.1)	108 (33.2)	248 (38.2)	df=3
Traditional	4 (1.2)	0 (0)	4 (0.6)	p=0.003
Ethnicity				
Yoruba	305 (93.8)	309 (95.1)	614 (94.5)	χ^2 = 0.471
Others	20 (6.2)	16 (4.9)	36 (5.5)	df=1
				p= 0.493

Table 2: Biochemical indices, measures of anthropometry and blood pressure in women with and without breast cancer at the luteal phase

VARIABLE	SUB-VARIABLE	PUBLIC N=325 (%)	PRIVATE N=325 (%)	TOTAL N=650 (%)	STATISTICAL INDICES
Summarized knowledge on menstruation	Good knowledge	236 (45.6)	282 (54.4)	518 (79.7)	χ^2= 20.115 df=1 p <0.001
	Poor Knowledge	89 (67.4)	43 (32.6)	132 (20.3)	

(76.3), respectively. In terms of types of schools, all the sample schools in this study were mixed (boys and girls) schools with 50% apiece, which was also significant statistically. With regards to religion, which was also statistically significant, a higher percentage of respondents in private schools were christian (54.5%) compared to their counterparts. This was not the case for other religions, as more public-school respondents were from Islamic religions (56.5%). Yoruba happens to be the commoner ethnic group among respondents, with private schools taking the larger share of the proportion (95.1%) compared to their counterparts with 93.8%, while other religions among public and private schools' respondents constitute 6.2% and 4.9% respectively.

There was a statistically significant difference between public and private school respondents in terms of age at which they had their first menstruation, with more people in the private schools (81.8%) having theirs before 13 years of age compared to the public (73.2%) schools' respondents. Respondents' knowledge about menstruation in public-private school locations was assessed. Most respondents in both public and private schools had access to information about menstruation before their first menses, 92.3% and 89.8%, respectively. There was a statistically significant difference between public and private respondents concerning the knowledge about where the blood comes from during menstruation, with the same proportion of respondents believing that blood comes from the uterus through the vagina, 50% apiece. (Table not shown). Regarding the level of knowledge, summarized knowledge of respondents on menstruation by public and private schools. More of the respondents in private schools have good knowledge (54.4%) compared to their counterparts in public schools and this was statistically significant (p <0.001).

Table 3 above shows the relationship between the summarized level of hygiene practices and the socio-demographic characteristics among respondents in public and private schools. The table shows a statistically significant difference between good hygiene practice, the class group, and the type of house the respondents live in among those attending public schools. In the same vein, the table also shows a statistically significant difference between good hygiene practice and the class group, religion and the type of house the respondents live among those attending private schools.

In the model for all respondents, those in junior classes among public school respondents were approximately two times less likely (1/0.506 = 1.97) to have good hygiene practice compared to their counterparts. Likewise, those whose parents lived in a self-owned apartment are approximately three times more likely to have good hygiene practices than those living in other apartments. These findings were only statistically significant for those in public schools.

DISCUSSION

The study reveals that menstruating girls at menarche are mostly before age 13. Two-thirds of the respondents started menstruation before age 13 compared with previous studies, which goes in line that "menarche occurs between 9-15 years, this indicates reproductive development and often comes with varieties of symptoms such as worry, anxiety, etc. [7]. Findings from this study show that most of the girls had information about menstruation before menarche. The major source of information is from their mothers, which is in line

Table 3: Respondents' socio-demographic characteristics and summarized level of hygiene practices in public and private schools

Socio-demographic variable	Sub-variable	Overall hygiene practice of respondents							
		PUBLIC n= 325				PRIVATE n=325			
		Good (%) n=180	Fair (%) n=93	Poor (%) n=52	Statistics χ^2, df (p-value)	Good (%) n=218	Fair (%) n=76	Poor (%) n=31	Statistics χ^2, df (p-value)
Age-group	Early Adolescence	24 (13.3)	10 (10.8)	1 (1.9)	χ^2=5.478 df=4 (p=0.242)	57 (26.1)	18 (23.7)	8 (25.8)	χ^2=5.655 df=4 (p=0.226)
	Mid-Adolescence	125 (69.4)	67 (72)	41 (78.8)	149 (68.3)	54 (71.1)	18 (58.1)		
	Late Adolescence	31 (17.2)	16 (17.2)	10 (19.2)	12 (5.5)	4 (5.3)	5 (16.1)		
Class	Junior Class	53 (29.4)	18 (19.4)	6 (11.5)	χ^2=8.511 df=2 (p=0.014)	41 (18.8)	25 (32.9)	5 (16.1)	χ^2=7.206 df=2 (p=0.027)
	Senior Class	127 (70.6)	75 (80.6)	46 (88.5)	177 (81.2)	51 (67.1)	26 (83.9)		
Religion	Christianity	94 (52.2)	55 (59.1)	32 (61.5)	χ^2=2.719 df=4 (p=0.606)	145 (66.5)	57 (75)	15 (48.4)	χ^2=7.048 df=2 (p=0.029)
	Islam	83 (46.1)	37 (39.8)	20 (38.5)	73 (33.5)	19 (25)	16 (51.6)		
	Traditional	3 (1.7)	1 (1.1)	0 (0)	0 (0)	0 (0)	0 (0)		
Ethnicity	Yoruba	169 (93.9)	87 (93.5)	49 (94.2)	χ^2=0.028 df=2 (p=0.986)	209 (95.9)	73 (96.1)	27 (87.1)	χ^2=4.666 df=2 (p=0.097)
	Others	11 (6.1)	6 (6.5)	3 (5.8)	9 (4.1)	3 (3.9)	4 (12.9)		
Mother's level of education	High Level	90 (50)	41 (44.1)	19 (36.5)	χ^2=3.166 df=2 (p=0.205)	153 (70.2)	46 (60.5)	18 (58.1)	χ^2=3.539 df=2 (p=0.170)
	High Level	90 (50)	52 (55.9)	33 (63.5)	65 (29.8)	30 (39.5)	13 (41.9)		
Mother's Occupation	Unskilled	90 (50)	50 (53.8)	26 (50)	χ^2=3.136 df=4 (p=0.535)	40 (18.3)	15 (19.7)	12 (38.7)	χ^2=9.424 df=4 (p=0.051)
	Artisan	34 (18.9)	15 (16.1)	14 (26.9)		22 (28.9)	7 (22.6)		
	Professional	56 (31.1)	28 (30.1)	12 (23.1)	47 (21.6) 131 (60.1)	39 (51.3)	12 (38.7)		

with other studies [10-12]. According to this study, most mothers have higher education levels, a finding that would possibly speak to them having a better knowledge of menstruation. These findings agree with studies in Asia, where the main source of information about menstruation in developing countries is mainly from mothers [13].

Despite the knowledge received before menarche, only half of the respondents knew the correct information about the menstrual cycle, which is "first day of last menstrual period to the first day of the next menstrual period". A normal monthly cycle for menstruation is between 21-35 days [15]. One-quarter of the respondents could accurately define the menstrual cycle range, this is in keeping with previous working revealing that only a few knew the menstrual cycle range is between 21-35 days [16]. During each cycle, menstrual flow could last for 4-7days on average, but our study revealed that two-thirds of the respondent had a duration of 1-3days menstrual flow monthly, seconded by the 4-7days flow. This study disagrees with a study from Dhingra et al., which states that regular menstruation lasts for a few days, usually 3-5 days, but anywhere from 2-7 days is considered normal [1]. The reason for fewer gaps in knowledge about menstruation could be connected to the fact that the mothers did not talk to their daughters about some points that did not seem relevant to them.

With regards to the knowledge of menstruation among all respondents, when comparing the level of knowledge about menstruation between private and public secondary schools, there was a small but significant difference. Most girls in private

Table 4: Biochemical indices, measures of anthropometry and blood pressure in women without breast cancer at the luteal and follicular phases

	Categories of Variable	p-value	Odd's ratio	95% Interval	Confidence
				Lower	Upper
Public school Respondents					
Class	Senior Class (Reference)	0.016*	0.506	0.290	0.883
Type of	Rented apartment (Reference)	0.076	0.522	0.265	0.620
	Family house	0.330	0.788	0.487	1.274
	Apartment owed by parents	0.038*	2.718	1.058	6.981
Private school Respondents					
Class	Senior Class (Reference)	0.054	1.729	0.991	3.017
	Islam (Reference)	0.587	1.152	0.692	1.916
Type of	Rented apartment (Reference)	0.294			
	Family house	0.289	1.322	0.790	2.212
	Apartment owed by parents	0.174	1.737	0.784	3.851

schools had a good knowledge of menstruation (54.4%, versus 45.5% p <0.001) compared to their counterparts in public schools. The reason for this could simply be a high level of education of the parents of private secondary school girls, which could have helped their daughters have good knowledge compared to their counterparts. This supports a study showing that the influence of the parents' level of education and the schools they attend could also contribute to girls' exposure to the latest information about menstruation [13]. However, when comparing the level of menstrual management among private and public-school adolescent girls, the study shows that public secondary schools had better management than their counterparts.

In terms of hygiene practices among all respondents, finding from the study shows that the respondents change their menstrual absorbents within 24 hours; half of the respondent change twice, while one-quarter change three times. This study agrees with a study by Omidvar et al., which states that, on average, a quarter of the respondents change their sanitary products twice daily, and half of the respondents change three times or more daily [17]. Further analysis showed the relationship between socio-demographic characteristics and the level of hygiene practice. The result shows that more of those in junior classes among public school respondents are approximately two times less likely to practice good hygiene than their counterparts. This relationship was statistically significant. Likewise, those whose parents live in self-owned homes are approximately three times more likely to have good hygiene practices than those living in rented/family-owned homes.

Practical implications: One plausible implication of these results is the need for adolescent girls to have accurate and adequate information about menstruation and its suitable hygiene practices. The study revealed that menstrual hygiene practices among the respondents were good, but proper education must be given to secondary school girls about personal hygiene practices and proper disposal of menstrual absorbents.

Study limitations: This study has its limitations, namely that participants were selected from a collection of schools in the State, not all schools; hence, this study could be replicated with samples from other states to allow longitudinal inferences. Moreover, there is also a need to conduct this study among out-of-school adolescent girls to broaden the scope covered.

CONCLUSION

Based on the study results, we conclude that the respondents' menstruation hygiene practices were statistically good. Further analysis using chi-square and logistics regression show that more respondents in junior classes among public school respondents were approximately two times less likely to have good hygiene practice compared to their counterparts. Likewise, those whose parents lived in a self-owned apartment are approximately three times more likely to have good hygiene practices than those living in other apartments. These findings were only statistically significant for those in public schools. Thus, more attention should be given to understanding menstruation among in-school girls and addressing the challenges they face in attending school while menstruating in both public and private schools. A supportive environment, accurate and comprehensive education that covers the process of menstruation should be added to the school curriculum.

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