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# Knowledge and Practice of Menstrual Hygiene among Female Students of Government Day Senior Secondary School (GDSSS) Tal, Billiri Local Government Area, Gombe State, Nigeria

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***Authors' contributions***

*This work was carried out in collaboration among all authors. All authors read and approved the final manuscript.*

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## ABSTRACT

This objective of this study was to assess the knowledge and common Menstrual Hygiene (MH) practices among female students at Government Day Secondary School (GDSS) Tal, Billiri Local Govt Area of Gombe State, Nigeria. A cross sectional descriptive study design was adopted for the study and a simple probability proportional to size (PPS) sampling technique was used to select a sample of 133 respondents out of a total of 194 female students aged 14 to 22 years, spread across all the three grades of senior secondary school students. A self-constructed 46-item instrument was used for data collection. The mean age at menarche (first menstrual period) for the girls was 14±1.24 years, and their average duration of menstrual flow was 3±1.04 days. A good majority (80.9%) of them exhibited either medium or higher level of knowledge of menstrual hygiene. This perhaps explains why majority (75.9%) of them used sanitary pad and 43.2% used new piece of cloth. Furthermore, majority (87.1%) of the girls were in the habit of changing pad/absorbent more than once in a day. Commendably, an overwhelming majority (90.8%) of them take bath two to three times a day, and 79.5% use soap and water for cleaning of their external genitalia, just as 66.4% of them impressively practice washing of their genitalia from front to back. Some of the factors that undermines menstrual hygiene as opined by the respondents include “No money to buy sanitary pad” (63.9%), “There is no privacy in school to change regularly” (60.0%), “Family only allows or affords use of tissue and cloth materials (34.6%) and “Religion forbids public places when menstruating (30.5%)”. Considering the above it is recommended that sustainable women and girlchild economic empowerment programmes and free school-based sanitary pad distribution interventions be deployed to the area of study.

*Keywords: Menstrual hygiene; secondary school; female students; practices.*

## 1. INTRODUCTION

Menstrual hygiene constitutes one of the myriads of public health issues plaguing the adolescent population, not only in sub-saharan Africa, but globally. Studies on menstrual hygiene in the developing world have found that most women and girls regularly failed to maintain a healthy menstrual hygiene practice [1,2,3]. Approximately 1.2 billion women across the world do not have sufficient access to menstruation sanitation products [4]. Limited resources, economic hardship, traditional norms and lack of education compel the women to seek alternative unhygienic methods and materials. Even in cases where females had sufficient knowledge regarding menstrual hygiene management (MHM), this did not translate to the practice of good menstrual hygiene due to adverse socio-cultural views and stigmatization of menstruation, which demanded the identification of the most vulnerable group of women [5].

Access to basic drinking water, sanitation and handwashing facilities as well as private place to wash and change; has been shown to be critical in ensuring MHM. Among those practicing inadequate MHM, only 32.3 percent reported living in a household using basic drinking water, sanitation and handwashing facilities, compared to 34.9 percent among women practicing adequate MHM [6]. In Nigeria, 44% of households lack access to improved sanitation facility and 29% don’t have uninterrupted access to piped water or water from tube well or borehole [7]. This exacerbates the challenges of lack of access to clean, effective absorbents; inadequate facilities to change, clean and dispose absorbents; lack of access to soap and water; and lack of privacy [8,9,10,11]. In the absence of suitable and affordable menstrual care products, some women and girls’ resort to using unhygienic and inappropriate products such as newspapers, old rags, dried leaves, or socks to collect menstrual blood and manage their products. In a survey on menstrual hygiene management among adolescent schoolgirls in Taraba State, Nigeria, only 57.58% had good menstrual hygiene management [12].

Menstruation is still regarded as something unclean or dirty in most societies. The reaction to menstruation depends upon awareness and knowledge about the subject matter. The manner in which a girl learns about menstruation and its associated changes may have an impact on her response to the event menarche. Most girls received their gynaecological information from their mothers, religious books, old sister or a peer. However, such information may have been

given after menarche rather than before. Menstrual practices are clouded by taboos and social cultural restrictions even today, resulting in adolescent girls remaining ignorant of the scientific fact and hygienic health practices necessary for maintaining positive reproductive health. Women having better knowledge regarding menstrual hygiene and safe practices are less vulnerable to reproductive tracts infections and its consequences. The social stigma attached to menstruation causes many girls and women to carry out dangerous hygiene practices, lacking a platform to share menstrual hygiene problems, girls and women often suffer from discomfort and infection, avoiding urination during menstruation, and using any kind of cloth available old or unwashed [13].

In an intervention by MSH among schoolgirls in the study area (Government Day senior secondary school Tal) with a focus on reproductive health care services, at endline there was a heightened level of awareness about maternal and reproductive health services [14]. However, specific evidence in regard to menstrual health practices among the girls within the study area has not been reported. Hence, this study intended to investigate the common menstrual hygiene practices among female students in the study area.

## 2. MATERIALS AND METHODS

### 2.1 Study Design

A cross-sectional descriptive study design was adopted for this study. This entails a single point survey that captures the current state of things as at the time and place of study. This design was adopted because it permits the researchers to study a sample with a view to generalizing the findings to the general population [15].

### 2.2 Study Area

The study area is government day senior secondary school (GDSSS) Tal, located at about 5 km west of Billiri the LGA headquarters. The school has a total population of 401, out of this number 194 are female students. The school is essentially a senior secondary school. The choice of the area was informed by the fact that it is a typical rural setting with all the socio-economic indices that compromises MH, as clearly described in an earlier work in the area by Management Sciences for Health [14].

### 2.3 Population of Study

A study planning visit to the school management provided some socio-demographic information needed to determine an adequate sample size for the study. According to the school record, the population of study comprised a total of 194 female students spread across the three senior secondary school arms of GDSSS Tal.

### 2.4 Sample Size Determination

The minimum sample size for this study was determined using a single proportion formula, as stated by Araoye [16].

$$n = \frac{Z^2 Pq}{d^2}$$

Where,

n= Minimum sample size

Z = Standard normal deviate, set at 1.96.

P = Estimated proportion or prevalence of the trait or phenomenon under study or investigation. Where there is no documented or reported figure, 50% or 0.5 is assumed (P = 0.5)

q = 1 – P (1- 0.5 = 0.5)

d = desired degree of accuracy set at 0.05

$$n = \frac{1.96^2 \times 0.5 \times 0.5}{0.05^2}$$

$$n = \frac{0.9604}{0.0025}$$

n = 384

Using the finite correction formula to calculate the adjusted (new) sample size (nf)

$$nf = \frac{n}{1 + n/N}$$

Where,

nf = Adjusted sample size when population is <10,000

N = Estimated study population

nf = 384/1+384/194

nf = 384/1+1.979

nf = 384/2.979

= 128.90 = 129

This was rounded up to 130 as the minimum sample size. But, to take care of non-response 10 additional copies of the instruments were administered. However, eventually only 133 of these instruments were considered usable.

## 2.5 Sampling Technique

The sampling technique adopted is the simple probability proportional to size (PPS) sampling technique, in which the proportions of various classes (sub-samples) were determined based on the calculated minimum sample size (Table 1). Eventually, the number determined per class were drawn using simple random sampling (SRS).

## 2.6 Instrument of Data Collection

A self-constructed questionnaire was drafted from diverse literature searches. It is made up of five sections (A, B, C, D & E). Section A: socio-demographic characteristics of respondents, which comprises of 11 items. Section B: obstetric and gynecological related characteristics of respondents, is made up of 5 items. Section C: knowledge of menstrual Hygiene among respondents, consists of 20 items to test knowledge. Section D: menstrual hygiene practices among respondents, has 7 items. Section E: Factors militating against the practice of menstrual hygiene management (MHM), consisting of 7 items.

## 2.7 Method of Data Collection

Data for this study was collected using self-administered questionnaires. The questionnaires were administered on captive groups of the female students in their classrooms. The students were supervised and guided during the data collection sessions. This was achieved with the aid of trained data collection assistants.

## 2.8 Validity and Reliability of Instrument

To test the validity and reliability of instrument for this study, a pilot test was conducted among female students in the senior section of Ibinola Government Day Secondary School Billiri. To assess content and construct validity, the instrument was given to the project supervisor and some experts for critical review, while Internal consistency reliability was determined using Cronbach's alpha test (>7.0).

## 2.9 Data Analysis

Data generated from this study were analyzes using IBM SPSS version 25. Descriptive statistics were computed - proportions of categorical variables were generated as frequency counts and percentages, while numeric variables were analyzed using means and standard deviation. Statistical significance of findings was established at *p*-values < 0.05.

**Table 1. Probability Proportional to Size (PPS) sampling of respondents**

| Class | Total number of female students per class | Percentage | Proportionate sample size per class |
|---|---|---|---|
| SSS1A | 35 | 18% | 24 |
| SSS1B | 30 | 15% | 20 |
| SSS2A | 20 | 10% | 14 |
| SSS2B | 10 | 5% | 7 |
| SSS2C | 34 | 18% | 23 |
| SSS3A | 20 | 10% | 14 |
| SSS3B | 15 | 8% | 11 |
| SSS3C | 30 | 15% | 20 |
| TOTAL | 194 | 100% | 133 |

*SSS = Senior Secondary School*

## 3. RESULTS AND DISCUSSION

Table 2 shows that about a half (49.6%) of the respondents fall with the age group of 17 to 18 years, and just a small proportion (14.3%) were above 18 years of age, although on average all were aged 17±1.46 years, ranging from 14 years to 22 years. It is also notable that majority (66.4%) of them live with both parents. By birth order slightly more than half (55.8%) of the female students were neither first nor last born in their families. Nuclear family structure was the predominant (75.8%) type of family the respondents belong to. The proportion of SSS1 students (43.2%) were more than the others.

The next Table 3 demonstrates that majority of the female school children had mothers (76.5%) and fathers (59.2%) that were educated up to secondary school level, while good proportions of the mothers were either housewives (36.6%) or farmers (44.3%). This description of the respondents according to their sociodemographic characteristics is very important because some similar studies from developing countries and Nigeria have associated these with menstrual hygiene knowledge and practices [12,17,18,19].

**Table 2. Socio-demographic characteristics of respondents**

| Variable/ Category | Frequency | Percent | Mean±SD |
|---|---|---|---|
| Age Group (14-22 Years) (n=133) | | | |
| <= 16 | 48 | 36.1 | 17±1.46 |
| 17 - 18 | 66 | 49.6 | |
| 19+ | 19 | 14.3 | |
| **Who do you live with? (n=131)** | | | |
| Both parents | 87 | 66.4 | |
| Mother only | 28 | 21.4 | |
| Father only | 6 | 4.6 | |
| Relatives | 10 | 7.6 | |
| **Birth Order (n=129)** | | | |
| First | 25 | 19.4 | |
| In between | 72 | 55.8 | |
| Last | 32 | 24.8 | |
| **Family Structure (n=132)** | | | |
| Nuclear | 100 | 75.8 | |
| Extended | 32 | 24.2 | |
| **Class of respondent (n=132)** | | | |
| SSS1 | 57 | 43.2 | |
| SSS2 | 29 | 22.0 | |
| SSS3 | 46 | 34.8 | |

**Table 3. Socio-demographic characteristics of respondents' parents**

| Variable/ Category | Frequency | Percent | Mean±SD |
|---|---|---|---|
| **Maternal level of education (n=132)** | | | |
| None | 2 | 1.5 | |
| Primary/Non-formal | 26 | 19.7 | |
| Secondary | 101 | 76.5 | |
| Tertiary | 3 | 2.3 | |
| **Paternal level of education (n=130)** | | | |
| None | 4 | 3.1 | |
| Primary/Non-formal | 31 | 23.8 | |
| Secondary | 77 | 59.2 | |
| Tertiary | 18 | 13.8 | |
| **Mothers Occupation (n=131)** | | | |
| Housewife | 48 | 36.6 | |
| Trading | 19 | 14.5 | |
| Civil Servant | 6 | 4.6 | |
| Farmer | 58 | 44.3 | |

### 3.1 Obstetric and Gynecological characteristics of Respondents

The respondents were further characterized based on their obstetric and gynecological related characteristics. Table 4 shows that the mean age of menarche among the female students was 14±1.24 years and more than half (55.3%) of them were aged 13 to 14. The average duration of their menstrual flow was 3±1.04 days with a remarkable proportion of them (30.5%) experiencing irregular monthly period. About a third (33.3%) of the adolescent girls attested to having a family history of dysmenorrhea (menstrual pain). The attainment of menarche at 14±1.24 years by the girls in this study is in tandem with the finding of Gultie et al [18] in Amhara Province, Ethiopia who reported 14.1±61.4 years. This was, however, slightly higher than the figure (13.7±6.7 years) reported by Nnennaya et al [12] in Taraba State, Nigeria. The mean duration of menstrual flow (3±1.04 days) observed in this study, agrees with the findings of Anikwea et al [20] who reported 3–5 days, in Abakaliki southeastern Nigeria. The experience of dysmenorrhea reported by 70.2% of the respondents of this study corroborates the experience by 82% respondents reported by Anikwea et al [20].

### 3.2 Respondents' Level of Knowledge and Practice of Menstrual Hygiene

From Table 5, it is observable that when tested on a 19-item knowledge about menstrual hygiene, there was an overall mean knowledge score of 11±2.63 among the respondents. Almost half (46.4%) of them had average or medium level of knowledge, while only 34.5% possessed high knowledge of menstrual hygiene. Overall, the girls had a mean menstrual hygiene knowledge level of 11±2.63. The percentage of girls with good or medium level of knowledge about menstrual hygiene (46.4%) reported in this study is lower than what was reported by Fehintola et al [21] who reported 55.9% good knowledge of menstruation and menstrual hygiene among study participants in Ogbomosho Oyo State southwestern Nigeria. Even much higher (90.7%) higher level of knowledge had been reported in Ethiopia [18] than is reported in this study (34.5%).

According to Table 5, when rated on a scale of 24 hygiene practices items, there was an overall good (17±2.37) level of menstrual hygiene practices among the girls. About a third (33.3%) of them were, rated very good or high. However, most (64.0%) of them had an average or good score. These finding contrasts that of Edet et al [22] who reported that 56.7% rural-based adolescent female students had a significantly poor knowledge of menstruation and menstrual hygiene practices, in the south southern Cross River State of Nigeria.

This might not be unconnected with the fact that there had been an intervention by management science for health (MSH) in the study area with focus on reproductive health care services, where at endline there was a heightened level of

**Table 4. Obstetric and gynecological characteristics of respondents**

| Variable/ Category | Frequency | Percent | Mean±SD |
|---|---|---|---|
| Age of Inception of menses/Menarche (n=132) | | | |
| <= 12 | 15 | 11.4 | 14±1.24 |
| 13 - 14 | 73 | 55.3 | |
| 15+ | 44 | 33.3 | |
| Average duration (days) of menstrual flow (n=131) | | | |
| <= 3 | 81 | 61.8 | 3±1.04 |
| 4+ | 50 | 38.2 | |
| Regularity of monthly period/menses (n=131) | | | |
| Irregularly | 40 | 30.5 | |
| Regularly | 91 | 69.5 | |
| Family history of dysmenorrhea (n=132) | | | |
| No | 44 | 33.3 | |
| Yes | 88 | 66.7 | |
| Experience/History of Dysmenorhoea (n=131) | | | |
| No | 39 | 29.8 | |
| Yes | 92 | 70.2 | |

awareness about maternal and reproductive health services [14]. And the finding also aligns with the findings of Garba et al [23] in Kano where they reported up to 92.2% use of sanitary pad among the schoolgirls. This, however, contradicts the findings of Surana et al [24] who stated that adolescent girls in rural area had ignorance, false perceptions, and unsafe practices regarding menstruation.

### 3.3 Knowledge and Common Menstrual Hygiene Practices among Respondents

Table 6 presents four dimensions of knowledge items regarding menses and menstruation among the respondents of this study. These include, menses, sources of bleeding, causes of menses and misconceptions about menstruation. Commendably, high proportions of showed correct knowledge about menses, where 88.5% held that menses is a normal phenomenon and 90.1% indicated that menses is unique to females. On sources of bleeding during menstruation, only 40.0% of the adolescents correctly indicated uterus as the source of bleeding, while most of them believed vagina is the source. While a relatively higher proportion (63.4%) of the respondents opined that menses is caused by hormonal changes, non-negligible proportions held that diseases (35.8%), and curses

**Table 5. Level of knowledge and practice of menstrual hygiene among respondents**

| Knowledge Level/ Category | Frequency | Percent | Mean±SD |
|---|---|---|---|
| Low <10 | 16 | 19.0 | |
| Medium 10 - 12 | 39 | 46.4 | |
| High 13+ | 29 | 34.5 | |
| Total | 84 | 100.0 | 11±2.63 |
| Common Hygiene Practices Level | | | |
| Poor <= 12 | 3 | 2.7 | |
| Good/Average 13 - 18 | 71 | 64.0 | |
| Very Good/High 19+ | 37 | 33.3 | |
| Total | 111 | 100.0 | 17±2.37 |

**Table 6. Items on Knowledge regarding menses and menstruation**

| Variable/Categories | Yes (%) | No (%) |
|---|---|---|
| **On Menses** | | |
| Menses is a normal phenomenon (n=130) | 115 (88.5) | 15 (11.5) |
| Menses is unique to females (n=121) | 109 (90.1) | 12 (9.9) |
| Menses is a lifelong process (n=128) | 77 (60.2) | 51 (39.8) |
| Menses will stop after initiation of sexual intercourse (n=123) | 78 (63.4) | 45 (36.6) |
| Menses is a sign of conception (n=122) | 96 (78.7) | 26 (21.3) |
| Menses has a foul smell (n=122) | 99 (81.1) | 23 (18.9) |
| Menses is pathological (n= 117) | 83 (70.9) | 34 (29.1) |
| **On Sources of Bleeding** | | |
| Bleeding from the uterus (n=125) | 50 (40.0) | 75 (60.0) |
| Bleeding from the bladder (n=124) | 38 (30.6) | 86 (69.4) |
| Bleeding from the vagina (n=125) | 95 (76.0) | 30 (24.0) |
| Bleeding from the abdomen (n= 124) | 48 (38.7) | 76 (61.3) |
| **On Causes of Menses** | | |
| Cause of menses is hormonal (n=123) | 78 (63.4) | 45 (36.6) |
| Cause of menses is from disease (n=123) | 44 (35.8) | 79 (64.2) |
| Cause of menses is from curse (n= 122) | 31 (25.4) | 91 (74.6) |
| **Misconceptions about menstruation** | | |
| Not allowed to touch others during menstruation (n= 130) | 61 (46.9) | 69 (53.1) |
| Not allowed to go to kitchens during menstruation (n=130) | 73 (56.2) | 57 (43.8) |
| Not to discuss about menses (n=129) | 65 (50.4) | 64 (49.6) |
| Activities done by menstruating woman are not blessed (n=126) | 37 (29.4) | 89 (70.6) |
| Being free from menses is a fate (n=119) | 57 (47.9) | 62 (52.1) |

**Table 7. Common menstrual hygiene practices among respondents**

| SN | Common Menstrual Hygiene Practice | Frequency | Percentage |
|---|---|---|---|
| | **Care seeking behaviour/Home remedy during menses** | | |
| 1 | Take pain relievers during menstruation (n=130) | 48 | 36.9 |
| 2 | Use hot water for drinking and massaging during menstruation (n=129) | 51 | 39.5 |
| 3 | Drink neem tree herb during menstruation (n=129) | 15 | 11.6 |
| 4 | Do nothing when in problem during menstruation (n=129) | 35 | 27.1 |
| | **Type of Absorbent Used** | | |
| 5 | New piece of cloth (n=132) | 57 | 43.2 |
| 6 | Old piece of Cloth (n=131) | 28 | 21.4 |
| 7 | Sanitary pad (n=133) | 101 | 75.9 |
| 8 | Toilet paper (n=131) | 21 | 16.0 |
| 9 | Cotton wool (n=131) | 13 | 9.9 |
| 10 | Change pad/absorbent more than once in a day (n=132) | 115 | 87.1 |
| | **Mode of washing of external genitalia** | | |
| 11 | Takes bath two to three times (n=130) | 118 | 90.8 |
| 12 | Use soap and water for cleaning of external genitalia (n=127) | 101 | 79.5 |
| 13 | Use water and antiseptic (n=129) | 37 | 28.7 |
| 14 | Use water only (n=126) | 13 | 10.3 |
| 15 | Wash genitalia front to back (n=128) | 85 | 66.4 |
| 16 | Wash genitalia back to front (n=127) | 29 | 22.8 |
| 17 | Wash genitalia front to back and back to front (n=126) | 32 | 25.4 |

(25.4%) were responsible. More so, surprisingly varied forms of myths and misconceptions were expressed by the respondents, examples of which include, “not allowed to touch others during menstruation (46.9%), “not allowed to go to kitchens during menstruation” (56.2%), and “not to discuss about menses” (50.4%).

Table 7 exhibits the common menstrual hygiene practices among the study subjects. It shows that the commonest care seeking behaviour or home remedy during menses were taking pain relievers during menstruation (36.9%) and use of hot water for drinking and massaging during menstruation (39.5%), while 27.1% of them would just do nothing. Majority (75.9%) of them use sanitary pad, 43.2% use new piece of cloth, while 21.4% use old piece of cloth. Majority (87.1%) were in the habit of changing pad/absorbent more than once in a day. Overwhelming majority (90.8%) of them take bath two to three times a day, and 79.5% use soap and water for cleaning of their external genitalia, while 66.4% practice washing their genitalia from front to back. The seemingly favourable metrics in this study is against the backdrop of reported challenges of lack of access to clean, effective absorbents; inadequate facilities to change, clean and dispose absorbents; lack of access to soap and water; and lack of privacy [8, 9, 10, 11]. However, thanks to an earlier intervention by management science for health (MSH) referred to earlier, findings from a neighbouring state of Taraba also tends corroborate this picture where 57.58% had good menstrual hygiene management [12].

## 4. CONCLUSION

From the summary and findings of this study, it is clear that though the metrics appear to be seemingly impressive on knowledge and practice of menstrual hygiene, there are still gaps that calls for continued efforts from the sides of both governmental and non-governmental bodies. Some of the practices observed among the respondents include 75.9% use of sanitary pad and 43.2% use of new piece of cloth. Furthermore, most (87.1%) of the girls change pad/absorbent more than once in a day. Some of the factors that undermines menstrual hygiene as opined by the respondents include “No money to buy sanitary pad” (63.9%), “There is no privacy in school to change regularly” (60.0%), “Family only allows or affords use of tissue and cloth materials (34.6%) and “Religion forbids public places when menstruating (30.5%).

## 5. RECOMMENDATION

In view of the findings of this study, the following recommendations and solutions are hereby proffered

- More school-based menstrual hygiene and reproductive health programmes such as peer education, sensitization and awareness creation, and distribution of free sanitary products should be deployed to the area and state
- Economic empowerment programmes targeted at women and the girlchild should be promoted by all stakeholders and relevant authorities
- Female sexual reproductive health lessons should be incorporated into the school curriculum
- Government and school management should ensure provision and access to WASH (water, sanitation and hygiene) facilities in schools for effective MHM.
- Religious leaders should be targeted for advocacy programmes that empowers them to disseminate correct messages on menstrual hygiene

## CONSENT

As per international standard or university standard, respondents' written consent has been collected and preserved by the author(s).

## ETHICAL APPROVAL

As per international standard or university standard written ethical approval has been collected and preserved by the author(s).

## COMPETING INTERESTS

Authors have declared that no competing interests exist.

## REFERENCES


1. Tegegne TK, Sisay MM. Menstrual hygiene management and school absenteeism among female adolescent students in Northeast Ethiopia. BMC Public Health. 2014;14:1118.
   DOI: 10.1186/1471-2458-14-1118
   Available:http://www.ncbi.nlm.nih.gov/pubmed/25355406
2. Hennegan J, Dolan C, Wu M, et al. Measuring the prevalence and impact of poor menstrual hygiene management: a quantitative survey of schoolgirls in rural Uganda. BMJ Open. 2016; 6:e012596.
   DOI: 10.1136/bmjopen-2016-012596
   Available:http://www.ncbi.nlm.nih.gov/pubmed/ 28039290
3. Van Eijk AM, Sivakami M, Thakkar MB, et al. Menstrual hygiene management among adolescent girls in India: A systematic review and meta-analysis. BMJ Open. 2016;6:e010290.
   DOI: 10.1136/bmjopen-2015-010290
   Available:http://www.ncbi.nlm.nih.gov/pubmed /26936906
4. Adames, B. The plight of period poverty in nigeria. The Borgen Project.
   Available:https://borgenproject.org/period-poverty-in-nigeria/2020.
5. Boakye-Yiadom A, Aladago DA, Beweleyir J, et al. Assessing the knowledge, attitude and practice of menstrual hygiene management among junior high schools adolescent females in the Yendi Municipality in the Northern region of Ghana. ESJ. 2018;14:467.
   DOI: 10.19044/esj.2018.v14n36p467
6. Anton B, Kim W, Nair A, Wang E. Menstrual hygiene management – Evidence from the 6th Round of MICS. MICS methodological. data and analytics section, division of data, analytics, planning and monitoring, UNICEF, New York. 2021;11.
7. National Population Commission (NPC) [Nigeria] and ICF. Nigeria demographic and health survey, 2018. Abuja, Nigeria, and Rockville, Maryland, USA: NPC and ICF; 2019.
8. Sommer M, Connolly S. "Growth and changes, Tech. Rep., Grow and Know, Inc. Cambodia; 2012.
   Available:https://www.unicef.org/cambodia/Growth_and_ Changes_lowres.pdf
9. House S, Mahon T, Cavill S. Menstrual hygiene matters: A resource for improving menstrual hygiene around the world. First Edit, Tech. Rep. WaterAid, London, UK. Ethiopia, BMC Public Health. 2012;14(1). Article 1118, 2014.
10. Rheinländer T, Wachira M. Emerging issue brief: Menstrual hygiene an ancient - But Ignored Global Health Problem of all women, global health minders; 2015.
    Available:http://ghm-menstrualhygiene-brief.pdf
11. Kaur R, Kaur K, Kaur R. Menstrual hygiene, management, and waste disposal: Practices and challenges faced by girls/women of developing countries, Journal of Environmental and Public Health; 2018.
    Article ID 1730964.

12. Nnennaya EU, Atinge S, Dogara SP, Ubandoma RJ. Menstrual hygiene management among adolescent schoolgirls in Taraba State, Nigeria. Afri Health Sci. 2021;21(2):842-851. Available:https://dx.doi.org/10.4314/ahs.v21i2.45
13. Mahajan A, Kaushaul K. A Descriptive study to access the knowledge and practice regarding menstrual hygiene among adolescent girls of government schools of Shimla, Himachal Pradesh. CHRISMED Journal of Health and Research. 2017;4(2):9-103. DOI: 10.4103/cjhr.ghr_103_16
14. Ayo A, Kpamor Z, Onungbogbo O, Tokara K, Okafor I, Umolu A. Teaching maternal and reproductive health to adolescent girls: Learning through creative processes in gombe, Nigeria. FY 2015 INCH Fund; 2015.
15. Schmidt NA, Brown JM. Evidence based practice for nurses: Appraisal and application of research. 2nd edition. Philadelphia. Lippincott Williams & Wilkins; 2012.
16. Araoye MO. Sample size determination. Research methodology with statistics for health and social sciences. 1st Ed. Ilorin: Nathadex Publishers. 2004;115-120.
17. Goel P, Kumar R, Meena GS, Garg S. Association of sociodemographic characteristics with KAP regarding menstrual hygiene among women in an urban area in Delhi. Trop J Obstet Gynaecol. 2018;35:158-64.
18. Gultie T, Hailu D, Workineh Y. Age of menarche and knowledge about menstrual hygiene management among adolescent school girls in amhara province, Ethiopia: Implication to health care workers & school teachers. PLoS ONE. 2014;9(9):e108644. DOI: 10.1371/Journal. pone.0108644
19. Sonowal P, Talukdar K, Saikia H. Sociodemographic factors and their association with menstrual hygiene practices among adolescent girls in Urban slums of Dibrugarh town, Assam. Journal of Family Medicine and Primary Care. 2021;10(12):4446–4451. Available:https://doi.org/10.4103/jfmpc.jfmpc_703_21
20. Anikwea CC, Mamaha JE, Okorochukwub BC, Nnadoziec UU, Obarezia CH, Ekwedigwe KC. Age at menarche, menstrual characteristics, and its associated morbidities among secondary school students in Abakaliki, Southeast Nigeria. Science Direct. Heliyon. 2020; 6(5):e04018.
21. Fehintola FO, Fehintola AO, Idowu A, Aremu AO, Ogunlaja OA, Ogunlaja IP. Assessment of knowledge, attitude and practice about menstruation and menstrual hygiene among secondary high school girls in Ogbomoso, Oyo state, Nigeria. Int J Reprod Contracept Obstet Gynecol. 2017; 6:1726-32.
22. Edet OB, Bassey PEM, Esienumoh EE, Ndep AO. An exploratory study of menstruation and menstrual hygiene knowledge among adolescents in urban and rural Secondary Schools in Cross River State. Nigeria; 2020.
23. Garba I, Rabiu A, Abubakar IS. Menstrual hygiene among adolescent schoolgirls in Kano. Trop J Obstet Gynaecol. 2018; 35:153-7.
24. Surana A, Rajesh DR, Tank R, Singh A, Gupta V, Agrawal D, et al. Social determinants of menstrual hygiene among school going girls in a rural area of Southern Haryana, India. Soc Health Behav. 2020;3:117-23.



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