Menstrual Hygiene Knowledge among Female Secondary School Students in Udenu Local Government Area, Enugu State

Ngozika Karen Enemuo[1*], Ogechi Gift Onyedi[2], Victoria Chinwudo Onah[3]

[1-3]Department of Human Kinetics and Health Education, University of Nigeria, Nsukka

*Corresponding Author: ngozika.enemuo@unn.edu.ng ; 08184062475

Abstract

Globally, menstrual hygiene is a major social and public health issue that affect women. The study assessed knowledge about menstrual hygiene among female secondary school students in Udenu Local Government Area (LGA), Enugu State. The cross-sectional research design was adopted, and a total of 2,421 female secondary school students of 400 female students participated in the study. The sample size selection was done using a two-stage sampling procedure. The instrument used for data collection was a researcher-designed questionnaire called "menstrual hygiene knowledge questionnaire (MHKQ)" which was validated by three experts. Frequencies and percentages were used for answering all the research questions while chi-square statistics was used to test the null hypotheses at 0.05 level of significance. Results revealed that female secondary school students had moderate knowledge (54.9%) of menstrual hygiene. The percentage response in JSS1-3 was 56.2% which was slightly higher than those in SSS1-3 with 54.4%, representing moderate menstrual hygiene knowledge statistically, no significant association was observed in the menstrual hygiene knowledge of the respondents based on class level. The study recommended among others, that the school administration and health facilities should implement various awareness and sensitization programmes regarding menstrual hygiene knowledge particularly in Udenu LGA, Enugu State.

Keywords: Menstruation, menstrual hygiene, knowledge, female secondary school student, research design, Udenu LGA

Introduction

Menstrual hygiene is a major social and public health issue that affects women across the globe regardless of their age, culture and other demographic characteristics. Globally, approximately 52 per cent of the female population is of reproductive age (WHO, 2018). Most of these women and girls menstruate each month for between two and seven days (United Nations Educational, Scientific and Cultural Organization [UNESCO], 2013). Menstruation is a natural process, but in most parts of the world it is a taboo and rarely talked about. Women and girls in many nations are faced with the challenges of menstruation (Sommer, Hirsch, Nathanson, & Parker, 2015). The World Bank (2018) reported that at least 500 million women and girls globally lack adequate facilities for menstrual hygiene management.

In Africa most girls are at risk of contracting genitourinary tract infections due to their unhygienic practices during their menstruation period (Annable et al., 2010). Also, studies have found that the use of sanitary pads is as low as 18 per cent amongst Tanzanian girls with the remainder using cloth or toilet paper (Baisley et al., 2009). Eleven per cent (11%) of girls in Ethiopia change their menstrual cloths ones a day (Sarah & Therese, 2012). A study conducted in Nandyal, Andhra Pradesh among adolescent school girls of rural field practice area of tertiary care hospital, about 54.3% and 60% don't having the knowledge regarding the cause of menstruation and origin of blood during menstruation respectively (Reddy, Pasha, & Fatima, 2024).

In most traditional settings including African societies, the topic of menstruation is largely treated as a taboo, and is rarely discussed publicly. This is because of the prevalent misconceptions; one of which is that menstruation is considered impure in some societies (Yagnik, 2015).

In Nigeria, poor menstrual hygiene practices still exist. Meanwhile, majority of secondary school girls in Nigeria are adolescent because they fall within the age bracket of 10-19 years as stated by World Health Organization (2009). They represent a significant segment (44.8%) of the country's population. Studies in Nigeria school girls have shown that majority 88.7% had good practice of menstrual hygiene and older age groups had more knowledge than the younger age group. The availability and ability to afford sanitary absorbents determine if a girl/ woman will use any kind of the sanitary absorbents available. Studies have shown that 44.1% used sanitary pads, and 21.2% used both cloth and sanitary pads, 56.8% used soap and water to clean their private part, and 43.2% used only water (Garba, Rabiu, & Abubakar, 2018), Sasmita, 2017). Another study reported that majority of girls in a rural girl's school who used old clothes, sanitized the materials by boiling and drying them before reuse. It was evident that such practice was protective against infection (Murye, & Mamba, 2017). Ahmed and Yesmin (2008) observed that poor girls and women in many countries, Nigeria inclusive cannot afford purpose made sanitary pads or napkins. Instead, the vast majority of them that were studied used rags. This practice according to the authors is responsible for a significant proportion of illness and infections associated with female reproductive health.

Menstruation is a phenomenon unique to the females. It is a normal physiological process during the females' reproductive age which is characterized by monthly shedding of the endometrial lining in menstrual fluid, which exits the uterus through the cervical opening and the body through the vagina (Aluko, Oluya, Olaleye, & Olajuyin, 2014). Menarche is one of the most important developmental milestones during adolescence (Reddy, Pasha & Fatima, 2024). Lack of good hygienic practices such as repeated use of unclean napkins or the improperly dried cloth napkins results in harbouring of micro-organisms, thereby, increasing the vulnerability to reproductive tract infections (Murthy, Mounika, Hanumanth & Kolli, 2022). Social prohibitions and the negative attitude of parents in discussing the related issues has led to a tendency for girls to associate a variety of negative physical and psychological changes on their body with menstruation (Sultan & Sahu, 2017).Menstrual period may be accompanied by discomfort, reproductive tract infection, smelling and embarrassment among others (Dasgupta & Sarkar, 2008). Hence, the need for good menstrual hygiene to improve the health condition of women.

Menstrual hygiene deals with the special health care needs and requirements of women during monthly menstruation or menstrual cycle. Menstrual hygiene is the practice of using clean materials to absorb menstrual blood that can be changed privately, safely hygienically, and as often as needed throughout the duration of the menstrual cycle (Garba, Rabiu, & Abubakar, 2018). Menstrual hygiene is personal hygiene during menstruation. Menstrual hygiene is fundamental to the dignity and wellbeing of women and girls and in this study Hygiene-related practices of women during menstruation are of considerable importance, as it has a health impact in terms of increased exposure to reproductive tract infection (RTI) and sexually transmitted infections and its complications (Sultan, & Sahu, 2017). In the context of this study, menstrual hygiene is the practice of using clean materials to absorb menstrual blood hygienically throughout the duration of the menstrual cycle by female secondary school students in Udenu LGA of Enugu State.

Knowledge is assumed to be a vital prerequisite to any effective practice. Knowledge is important to man's quality of life because many things we do depend on the knowledge we have (Enemuo, Iwuagwu & Obayi, 2020). According to Oparah, Fidelis and Nwankwo, (2019), knowledge is the possession of information, skill and understanding gain through learning and experience. Knowledge is very important in every aspect of life, including

menstrual hygiene. Menstrual health knowledge is regarded as having knowledge of menstruation and the need for effective management of health during menstruation. This information is vital at the young age group, before menarche because a girl should know of what menstruation is and how to handle it and therefore be prepared for it (Idoko, Okafor, Ayegba, Bala, & Evuka, 2022). Menstrual hygiene knowledge is having the knowledge of what materials to be used that can be changed as often as necessary for the duration of the menstruation period and the use of soap with water for washing the body as required and having access to facilities for proper disposal after use. Some studies have shown 60.9% of women had good knowledge of menstrual hygiene and 39.9% had good practice of menstrual hygiene respectively (Upashe, Tekelab, & Mekonnen, 2015).

Knowledge of the menstrual cycle and awareness of the likely symptoms associated with it will help a woman be prepared for these periods and the people around her will understand that she is experiencing such changes and so not tag her as being hysterical or sick (Sultan, & Sahu, 2017; Garba, Rabiu, & Abubakar, 2018; Sasmita, 2017). Also, the occurrence of reproductive tract infections will decrease as this can affect the health of women greatly. In this study, knowledge is referred to as the understanding of all information, truth and facts relating to menstrual hygiene by female in-school adolescents in Udenu LGA, Enugu State. A good knowledge of menstrual hygiene generally reflects a positive attitude towards menstrual hygiene practices. Attitude towards menstrual hygiene could reflect female in-school adolescents' adoption of menstrual hygiene practice.

The concept of adolescents has been variously defined. Adolescence is defined by the World Health Organization as the time between the ages of 10 and 19, and teenage girls make up about one-fifth of all females worldwide (Tamphasana, Rajkumari & Devi, 2020). Adolescents are individuals within the age of 10 and 19 years in a transitional phase of growth and development between childhood and adulthood (Garba, Rabiu, & Abubakar, 2018). In addition, they follow particular taboos during menstruation and menarche (Thakre, Thakre, Reddy, Rathi, Pathak, & Ughade, 2011; Upashe, Tekelab, & Mekonnen, 2015). In this study, adolescents are individuals of ages 10-19 years attending secondary schools in Udenu LGA, Enugu State. This study however, focused on adolescents who are currently enrolled into secondary schools in Udenu LGA, Enugu State. They are known as in-school adolescents. In this study, in-school female adolescent girls are group of females between the ages of 10-19 years or more who are attending secondary school in Udenu LGA, Enugu StateThe menstrual hygiene knowledge and practices adopted by in-school adolescents are influenced by certain socio-demographic factors.

Socio-demographic factors are those variables that could influence the outcome of events. They refer to the variables that can in one way or the other affect the outcome of a phenomenon. They are also those factors that can affect the results and findings of research works. In the course of this study, socio-demographic factors are those variables that affect menstrual hygiene knowledge, attitude and practices of female in-school adolescents. The main factor includes academic class level.

Academic class level refers to the stage at which an individual is in her academic pursuit. It is a socio-demographic factor capable of affecting menstrual hygiene knowledge, attitude and practices of female in-school adolescents (Parajuli, Paudel, & Shrestha, 2016). In most secondary schools, there are classes from J.S.S 1 to 3 for the Junior Secondary and also S.S.S 1 to 3 for the Senior Secondary. Most of the subject taught in junior secondary are not health related, while in the senior secondary are so many health related subjects namely, Health Science, Biology, and so on that exposes students to the world of menstruation, menstrual hygiene as well as to menstrual hygiene practices as the case may be. This is to say that students in the senior secondary may have more knowledge, better attitudes and practices of menstrual hygiene than those in the junior secondary. Several studies have identified class

level as a socio-demographic factor affecting menstrual hygiene knowledge, attitude and practices (Ali, & Rizvi, 2010; Sushedna, & Dasgupta, 2010; Belayneh, & Mekuriaw, 2019). This study will examine if academic class level is capable of influencing menstrual hygiene knowledge and attitude of in-school adolescents. This study was conducted in Udenu LGA, Enugu State

Udenu is a Local Government Area located in Enugu State. Udenu LGA headquarters is located in Obollo-Afor town and consists of twenty-five communities. Its headquarters is in the town of Obollo-Afor (or Obolo). Udenu LGA has an area of 248 km^2 (96 sq mi) and a population of 178,466 at the 2006 census (2006 national census). The natives are majorly Christians but there are still those who practice traditional religion. Udenu LGA is predominantly rural LGA with many secondary school girls; this menstruation is typically viewed as unclean by some societies. A negative attitude about this condition has been perpetuated by efforts to isolate and restrict menstruation females in the household. Numerous investigations have discovered restrictions in daily activities (Khatoon, et al., 2023). Menstruation and the problems associated with it are taboo subjects in many developing countries. Many young girls therefore lack adequate information and essential understanding regarding menstrual hygiene (Sapkota, Sharma, Pokharel, Budhathoki & Khanal, 2014). There is a substantial knowledge gap regarding menstruation among teenage girls. Numerous studies have highlighted this gap, showing that when women first started menstruating, they knew very little about it. Several studies have shown that most adolescent females have incomplete and incorrect knowledge of the physiology and hygiene of menstruation (Prajapati, & Patel, 2015). Thus, secondary school girls in Udenu, like their counterparts in other parts of the nation may encounter many challenges on issues relating to their sexuality, especially menstruation, its knowledge, attitude and practice. Hence, the need for the present study to ascertain the menstrual hygiene knowledge of in-school adolescents in Udenu LGA, Enugu State

Purpose of the Study

The purpose of this study was to ascertain the menstrual hygiene knowledge possessed by female secondary school students in Udenu Local Government Area, Enugu State. Specifically, the study sought to determine the:

1. menstrual hygiene knowledge possessed by female secondary school students in Udenu LGA, Enugu State;
2. menstrual hygiene knowledge of possessed by female secondary school students in Udenu LGA, Enugu State based on class level

Research Questions

The following research questions were posed to guide the study:

1. What is the menstrual hygiene knowledge possessed by female secondary school students in Udenu LGA, Enugu State?
2. What is the menstrual hygiene knowledge possessed by female secondary school students in Udenu LGA, Enugu State based on class level?

Hypotheses

The following hypotheses were postulated to guide the study, and were tested at .05 level

of significance:

1. There is no significant association in the knowledge of menstrual hygiene possessed by

female secondary school students in Udenu LGA, Enugu State based on class level

Methods

The cross-sectional research design was adopted for use in this study so as to achieve the purpose of the study. Descriptive research design according to Cohen et al. (2011) is a research design that produces a snapshot of the population in a given period of time. The design is therefore suitable for use in this study because it has been successfully used by Varghese, Ravichandran et al. (2015) to assess the knowledge and practice of menstrual hygiene among adolescent girls. The successful adoption of the design in this similar study informed its choice for this study.

The population for the study consisted of all female in-school adolescents in all the sixteen (16) secondary schools in Udenu LGA of Enugu State. Their total population is two thousand, four hundred and twenty-one (2,421) for the 2020/2021 academic session. This is according to the statistics made available from Udenu Post Primary Education Board, Enugu State (2021).

The sample for the study was 400 female in-school adolescents. This is in line with the suggestion of Cohen, Manion and Morrison (2011), that when a population size is 2,000 and above at 95 per cent confidence level (5% interval), the sample size should be 322 and above. The sample size was drawn in two stages. Stage one involved a simple random sampling of ten secondary schools from the sixteen without replacement. The second stage also involved simple random sampling of balloting without replacement to select forty (40) female in-school adolescents from each of the ten secondary schools sampled in stage one. This gave a total of 400 female in-school adolescents to be used for the study.

The instrument for data collection consisted of a researcher-designed instrument titled "Menstrual Hygiene Knowledge Questionnaire" (MHKQ). The MHKQ comprised of two sections of A and B. Section A sought information on the socio-demographic data (academic class level) of the respondents with double response options. Section B sought information on menstrual hygiene knowledge among the respondents with dichotomous response option of Yes and No.

The face validity of the instrument was established by giving the copies of the instrument, the purpose of the study with its specific objectives and research questions as well as hypotheses to three experts in the Department of Human Kinetics and Health Education, University of Nigeria, Nsukka. The expert's constructive criticism, corrections and suggestions were used to modify and improve the final draft of the instrument before its use in the present study.

The reliability of the instruments was established using Cronbach's Alpha method of reliability to determine the internal consistency of MHKQ. Twenty copies of the instrument were administered to twenty female in-school adolescents in Nsukka LGA because of their similar characteristics with the study area. The reliability of the instruments was calculated using split-half method. Cohen, Manion and Morrison (2011) maintained that if the correlation co-efficient index obtained is 0.7 and above, the instrument was considered reliable for the study.

In order to gain access to the respondents, a letter of introduction was obtained from the Head, Department of Human Kinetics and Health Education, University of Nigeria, Nsukka, introducing the researcher and explaining the purpose of the study. This letter was presented to the principals of the secondary schools in Udenu LGA of Enugu State seeking for permission to carry out the study in their schools. Copies of the MHKQ were administered to female in-school adolescents by the researcher in their classrooms. The class teachers of the various classes acted as research assistants for the researcher. The research assistants were briefed on the methods of administering the questionnaire. The female in-school adolescents were asked to supply correct information. The questionnaires

administered were collected on the spot by the researcher when the female in-school adolescents have supplied all the necessary information required.

The returned copies of the completed questionnaires were properly cross-checked for completeness of responses. The returned copies of the completed questionnaires were properly cross-checked for completeness of responses. Four hundred (400) copies of the questionnaire were distributed with return rate of 92.3 per cent (369 copies).The information from copies of the questionnaires was coded and analyzed using Internal Business Machine Statistical Package for Social Sciences, IBM-SPSS (version 23 statistics for windows). Research questions on knowledge of menstrual hygiene were answered using frequencies and percentages. Chi-square statistics were used to test the null hypotheses. However, p-value of .05 was used to determine statistical significance of the null hypotheses at appropriate degrees of freedom.

Results

Table 1
Percentage Responses on Menstrual Hygiene Knowledge Possessed by Female Secondary School Students in Udenu LGA, Enugu State (n=369)

S/N	Menstrual Hygiene Knowledge	TRUE f(%)	FALSE f(%)
	Menstrual hygiene involves complete cleanings of the body (reproductive organs) during menses	161(43.6)	208(56.4)
	Menstrual hygiene involves changing of menstrual pad regularly	266(72.1)	103(27.9)
	Menstrual hygiene includes getting the menstrual pads/absorbents ready before menstruation	265(71.8)	104(28.2)
	Menstrual hygiene involves washing the vulva/vagina properly with clean water	282(76.4)	87(23.6)
	Menstrual hygiene can be practiced without understanding of the duration and periods of menstrual cycle	146(39.6)	223(60.4)
	Menstrual hygiene can help improve overall health	257(69.6)	112(30.4)
	Menstrual hygiene reduces spread of communicable diseases	99(26.8)	270(73.2)
	Menstrual hygiene prevents bacterial infection	146(39.6)	223(60.4)
	Cluster %	54.9	45.1

Key: 0–39%=Low knowledge; 40%-69%=Moderate knowledge; 70% and above=High knowledge.

Results in Table 2 showed that 54.9 per cent of female secondary school students in Udenu LGA, Enugu State had knowledge of menstrual hygiene. This table indicated that female secondary school students in Udenu LGA, Enugu State had moderate knowledge on menstrual hygiene. Also, this table shows that majority of the respondent; practiced menstrual hygiene without understanding of the duration and periods of menstrual cycle (60.4%), did not know that menstrual hygiene reduces spread of communicable diseases (73.4%), did not know that menstrual hygiene prevents bacterial infection (60.4%).

Table 2
Percentage Responses of Menstrual Hygiene Possessed by Female Secondary School Students in Udenu LGA, Enugu State Based on Class Level (n=369)

S/N	Menstrual Hygiene Knowledge	JSS 1 – 3 (149) TRUE f(%)	JSS 1 – 3 (149) FALSE f(%)	SSS 1 – 3 (220) TRUE f(%)	SSS 1 – 3 (220) FALSE f(%)
	Menstrual hygiene involves complete cleanings of the body (reproductive organs) during menses	71(47.6)	78(52.4)	90(40.7)	130(59.3)
	Menstrual hygiene involves changing of menstrual pad regularly	106(72.0)	43(28.0)	160(73.4)	60(26.6)
	Menstrual hygiene includes getting the menstrual pads/absorbents ready before menstruation	99(67.1)	50(32.9)	166(76.2)	54(23.8)
	Menstrual hygiene involves washing the vulva/vagina properly with clean water	115(78.3)	34(21.7)	167(76.6)	53(23.4)
	Menstrual hygiene can be practiced without understanding of the duration and periods of menstrual cycle	64(42.7)	85(57.3)	82(36.9)	138(63.1)
	Menstrual hygiene can help improve overall health	105(71.3)	44(28.7)	152(69.6)	68(30.4)
	Menstrual hygiene reduces spread of communicable diseases	43(28.0)	106(72.0)	56(24.8)	164(75.2)
	Menstrual hygiene prevents bacterial infection	64(42.7)	85(57.3)	82(36.9)	138(63.1)
	Cluster %	56.2	43.8	54.4	45.6

Key: 0–39%=Low knowledge; 40%-69%=Moderate knowledge; 70% and above=High knowledge.

Results in Table 2 showed that the percentage of the respondents in JSS 1-3 that have knowledge of menstrual hygiene is slightly higher than those in SSS 1-3 (JSS 1=56.2%; SSS 1=54.4%). Table 2 revealed that both Junior Secondary and Senior Secondary have moderate knowledge of menstrual hygiene.

Table 3
Summary of Chi-square Analysis on the Knowledge of Menstrual Hygiene Possessed by Female Secondary School Students in Udenu LGA, Enugu State Based on Class Level (n=369)

Class Level	N	Menstrual Hygiene True O (E)	Menstrual Hygiene False O (E)	χ^2	Df	p-value	Decision
JSS 1 – 3	149	112 (99.5)	46 (41.5)	.231	1	.102	Not rejected
SSS 1 – 3	220	147 (140.5)	69 (62.5)				

*Significant $p \leq 0.05$

Table 3 showed that there is no significant difference in the knowledge of menstrual hygiene possessed by female secondary school students in Udenu LGA, Enugu State based on class level (χ^2= .231; p-value= .102). Since, the p-value of .102 is greater than .05 level of significance; the null hypothesis was not rejected. Therefore, there is no significant difference in the knowledge of menstrual hygiene possessed by female secondary school students in Udenu LGA, Enugu State based on class level.

Discussion

Results in Table 1 showed that slightly more than half of the respondents had knowledge of menstrual hygiene. This finding is not expected because female secondary school students ought to have good knowledge of menstrual hygiene, not just moderate level of knowledge. This is so because they ought to be thought by their mothers in their houses and by their teachers in the school. This finding contradicts that of Lawan et al. (2010) who reported high level of knowledge of menstrual hygiene among adolescent school girls in Kano, North West Nigeria. This study indicated that, about 72.1% knew that menstrual hygiene involves changing of menstrual pad regularly, about 71.8%, knew that menstrual hygiene includes getting the menstrual pads/absorbents ready before menstruation. Similarly, the study by Reddy et al.. (2024) shows the practice about menstruation and menstrual hygiene, about 76.5% were using sanitary pads during menses, and about 73% are practicing the hygienic process by cleaning the external genitalia after changing the pad. Also, a study by Upashe et al. (2015), more than half (60.9 %) of the students had good knowledge about menstruation and menstrual hygiene.

Results in Table 2 showed that the respondents did not differ in their knowledge of menstrual hygiene based on class level. Result in Table 3 also showed that there is no significant association in the knowledge of menstrual hygiene possessed by the respondents based on class level. This implies that female secondary school students in Udenu LGA, Enugu State did not differ in their level of knowledge of menstrual hygiene based on class level. This finding is not expected and very surprising because class level ought to influence level of knowledge of menstrual hygiene among female secondary school students. This is because students in senior classes offer more health related subjects with improved syllables than students in junior classes. This finding agrees with those of Belayneh and Mekuriaw (2019) who reported good knowledge of menstrual hygiene among young adolescent school girls in southern Ethiopia. Also, study by Nagar et al. (2018) among School going adolescent Girls of Bhopal, Madhya Pradesh, more than half of the students who belonged to 11th class had a moderate/ good knowledge score. However the association between age, class and knowledge score was found to be insignificant.

Conclusion

Based on the finding, the study indicated that female secondary school in Udenu had moderate menstrual hygiene knowledge, which may be due to lack of knowledge in the area of menstruation, which is regarded as taboo; even some culture and belief still see it as a topic that should be discussed secretly. Also, most mothers are ignorant of the true/ correct knowledge about menstruation and menstrual hygiene. Therefore, there is need to disseminate basic knowledge about menstruation across all ages to ensure that menstrual hygiene will be achieved. There is no significant difference in the knowledge of menstrual hygiene possessed by female secondary school students in Udenu LGA, Enugu State based on class level.

Recommendations

1. This study suggests that knowledge towards the menstruation and menstrual hygiene should be made public through the government agencies, non- government agencies and health sectors are need to be improved by health education, frequent training activities
2. The school administration and health facilities should implement various awareness and sensitization programmes regarding menstrual hygiene knowledge particularly in Udenu LGA, Enugu State.
3. To increase this knowledge, health educators may choose to organize seminars and workshops as a medium to better impact on female students the knowledge of menstrual hygiene. This knowledge will help them to practice menstrual hygiene effectively and avoid diseases.

References

Ali, T. S., & Rizvi, S. N. (2010). Menstrual knowledge and practices of female adolescents in urban Karachi, Pakistan. *Journal of Adolescence, 33*(4), 531-541.

Aluko, O. O., Oluya, M., Olaleye, O. A., & Olajuyin, A. A. (2014). Knowledge and menstrual hygiene practices among adolescents in senior secondary schools in Ile Ife, south-western Nigeria. *Journal of Water, Sanitation and Hygiene for Development, 4* (2), 248.

Amoran, O. E., & Onwube, O. O. (2013). Infection Control and Practice of Standard Precautions among Healthcare Workers in Northern Nigeria. *Global Infectious Diseases, 5*, 156-63.

Aniebue, U. U., Aniebue, P. N., & Nwankwo, T. O. (2009). The impact of pre-menarcheal traning on menstrual practices and hygiene of Nigerian school girls. *Pan African Medical Journal, 219.*

Annable, S., Abebaw, F., Worku, A., Woldemariam, G., Helen, A., & Behailu, G. (2010). Ethiopia young adult survey: A study in seven regions. Addis Ababa, Ethiopia,

population council. http://itacaddis.or/docs/2013-24-08-12-15-ethiopianyoungadultsurvey2010.pdf

Baishakhi, P., Agnihotri, B., & Sukes, D. (2013). A Comparative Study on Menstrual Hygiene among Urban and Rural Adolescent Girls of West Bengal, Goodwill Printing Press.

Baisley, K., Changalucha, J., Weiss, H. A., Mugeye, K., Everett, D., & Hambleto, I. (2009). Bacterial vaginosis in female facility workers in north-western Tanzania: Prevalence and risk factors. *Sexually Transmitted Infections, 85,* 370-375.

Belayneh, Z., & Mekuriaw, B. (2019). Knowledge and menstrual hygiene practice among adolescent school girls in southern Ethiopia: A cross-sectional study. *BMC Public Health 19*, 595.

Blum, R., & Mmari, K. (2006). *Risk and protective factors affecting adolescent reproductive health in developing countries: An analysis of adolescent sexual and reproductive health literature from around the world. Geneva, Switzerland*: World Health Organization.

Census, A. I. (2015). *Menstrual Health of Adolescents: Insight on Sexually Transmitted Infections.* Ibadan: Young shall grow publishers.

Chinyama, J., Chipungu, J., Rudd, C., Mwale, M., Verstraete, L., Sikamo, C., Mutale, W., Chilengi, R., & Sharma, A. (2019). Menstrual hygiene management in rural schools of Zambia: a descriptive study of knowledge, experiences and challenges faced by schoolgirls. *BMC Public Health, 19,* 16.

Cohen, L., Manion, L., & Morrison, K. (2011). *Research methods in education* (7th ed). United Kingdom: Routledge.

Deepanjali, B., Sivakami, M., & Manas, R. B. (2015). Menarche and Menstruation in Rural Adolescent Girls in Maharashtra, India: A Qualitative Study. *Journal of Health Management, 17*(4), 510-519.

Edet, O. B., Bassey, P. E. M., Esienumoh, E. E., & Ndep, A. O. (2020). An exploratory study of menstruation and menstrual hygiene knowledge among adolescents in urban and rural secondary schools in Cross River State, Nigeria. *African Journal of Biomedical Research, 23,* 321- 326.

Eleen, K., Florence, N.O. & Gaudencia, O. (2018) Menstrual Hygiene Management Practices among Primary School Girls from a Pastoralist Community in Kenya: A Cross Sectional Survey. *Pan African Medical Journal, 31,* https://doi.org/10.11604/pamj.2018.31.222.13521

Enemuo, N. K., Iwuagwu, T. E., & Obayi, B. A. (2020). Knowledge of risk factors for breast cancer among female secondary school teachers in Enugu East LGA, Enugu State. *Nigerian Journal of Health Promotion, 13,* 22-32.

Fishbein, M., & Ajzen, I. (1975). *Belief, attitude, intention, and behavior: An introduction to theory and research.* Reading, MA: Addison-Wesley.

Garba, I., Rabiu, A., & Abubakar, I.S. (2018) Menstrual Hygiene among Adolescent School Girls in Kano. *Tropical Journal of Obstetrics and Gynaecology, 35,* 153-157. https://doi.org/10.4103/TJOG.TJOG_81_17

Grusec, J. (1992). Social learning theory and developmental psychology: The legacies of Robert Sears and Albert Bandura. *Developmental Psychology, 28*(5), 776–786.

House, S., Mahon, T., & Cavill, S. (2012). *Menstrual hygiene matters - A resource for improving menstrual hygiene around the world.* https://www.susana.org/en/knowledge-hub/resources-and-publications/library/details/2210

Idoko, L.O., Okafor, K.C., Ayegba, V.O., Bala, S.., & Evuka, V.B. (2022). Knowledge and Practice of Menstrual Health and Hygiene among Young People in Jos, Plateau State, Nigeria. *Open Journal of Obstetrics and Gynecology, 12*, 292-308. https://doi.org/10.4236/ojog.2022.124028

Khatoon, R. Ansari , S. Asghar, S. A., Sachan, B., Zaidi, Z. H., & Ahmad, S. (2023). Knowledge, attitude, and practices of adolescent school girls regarding menstrual hygiene in Lucknow district. *Asian Journal of Medical Sciences, 14* (2) 90-95. http://nepjol.info/index.php/AJMS DOI: 10.3126/ajms.v14i2.49421

Kumar, A., & Srivastava, K. (2011). Cultural and Social Practices Regarding Menstruation among Adolescent Girls. *Social Work in Public Health*, *26*(6), 594-604.

Lawan, U. M., Yusuf, N. W., & Musa, A. B. (2010). Menstruation and menstrual hygiene amongst adolescent school girls in Kano, Northwestern Nigeria. *African Journal of Reproductive Health*, *14*(3), 1-7.

Mahon, T., Fernandes, M. (2009). Menstrual hygiene in South Asia: A neglected issue for WASH (water, sanitation and hygiene) programmes. *Gender and Development 18*, 99–113.

McMahon, S. A., Winch, P. J., Caruso, B. A., Obure, A. F., Ogutu, E. A., & Ochari I. A. (2011). The girl with her period is the one to hang her head: Reflections on menstrual management among schoolgirls in rural Kenya. *BMC International Health and Human Rights*, *11*(7).

Mohammed, S., Larsen-Reindorf, R. E., Awal, I., & Beydoun, H. A. (2020). Menstrual hygiene management and school absenteeism among adolescents in Ghana: Results from a school-based cross-sectional study in a rural community. *PLoS ONE, 15*(10), e0241106.

Montgomery, P., Ryus, C. R., Dolan, C. S., Dopson, S., & Scott, L. M. (2012). Sanitary pad interventions for girls' education in Ghana: A pilot study. *PLoS ONE, 7.*

Murye, A.F. & Mamba, S.R. (2017) Practices of Managing Menstrual Hygiene by Girls in Public Boarding Schools—The Case of Hhohho Region of Swaziland. *Health Science Journals, 11*, 534. https://doi.org/10.21767/1791-809X.1000534

Musiguzi, B. (2006). *Make Help Girls to Stay in school The Monitor 88 (Kampala)*. http://allafrica/stories/20061215369.html retrieved on 26th Sept. 2012.

Nadeem, Z. B. (2016). *Types of attitude.* Retrieve from https://www.linkedin.com/pulse/types-attitudes-zafar-bilal-nadeem

Nagar, V., Yadav, K., Mitra , A., Tomar , A., Sharma, S., & Pankaj, P. A. (2018). Menstrual Hygiene-A Hidden And Neglected Issue: A Cross Sectional Study among School Going Adolescent Girls of Bhopal, Madhya *Pradesh, 7*(7) 2277 - 8179.

Olaide, B. E. (2017). *Menstrual Hygiene Practices among in-school adolescents in Urban and Rural secondary schools in Cross River State, Nigeria: A pilot study*.

https://www.researchgate.net/publication/317950812_Menstrual_Hygiene_Practices_among_inschool_adolescents_in_Urban_and_Rural_secondary_schools_in_Cross_River_State_Nigeria_A_pilot_study

Olayinka, O. O., & Akinyinka, O. O. (2004). Unmet need for sexuality education among adolescent girls in South West Nigeria: A cumulative analysis. *African Journal of Reproductive Health, 8* (3), 27-33.

Oparah, J. S., Fidelis, N. M., & Nwankwo, C. U. (2019). Knowledge of causes and preventive measures of maternal and infant mortality among mothers in Onuimo LGA, Imo State. *Nigerian Journal of Health Promotion, 12,* 105 -112.

Parajuli, P., Paudel, N., & Shrestha, S. (2016). Knowledge and practices regarding menstrual hygiene among adolescent girls of rural Nepal. *Journal of Kathmandu Medical College, 5*(15), 1.

Reddy, K. M., Pasha, M. A. M.., & Fatima, A. (2024). Knowledge, attitude and practice about menstruation and menstrual hygiene among adolescent school girls of rural field practice area of tertiary care hospital, Nandyal, Andhra Pradesh: a cross-sectional study. *Int J Community Med Public Health ; 11,* 1639-43

Saaku, B. F (2017). *Demographic determinants of risky sexual behavour among in-school adolescents in Wukari Local Government Area, Taraba State*. (Unpublished Master's thesis). University of Nigeria, Nsukka.

Sasmita, G. (2017). Knowledge Regarding Menstrual Hygiene among Adolescent Girls. *International Journal of Research in Medical Sciences, 5*. https://doi.org/10.18203/2320-6012.ijrms20173534

Sommer, M., & Sahin, M. (2013). Overcoming the taboo: Advancing the global agenda for menstrual hygiene management for school girls. *American Journal of Public Health 103,* 1556–1559.

Sommer, M., Hirsch, J. S., Nathanson, C.,, & Parker, R. G. (2015). Comfortably, Safely, and Without Shame: Defining Menstrual Hygiene Management as a Public Health Issue. *American Journal of Public Health, 105*(7), 1302-1311.

Sommer, M., Sutherland, C., & Chandra-Mouli, V. (2015). Putting menarche and girls into the global population health agenda. *Reproductive Health 12,* 24.

Sudeshna and Aparajita. (2012). Determinants of menstrual hygiene among adolescent girls: A multivariate analysis. *National Journal of Community Medicine, 3*(2), 294-301.

Sultan, S.,, & Sahu, D. S. (2017). Knowledge, attitude and practices about menstruation and related problems in adolescent girls. *Int J Reprod Contracept Obstet Gynecol. 6*(12),5235-40.

Sushedna, R., & Dasgupta, A. (2010). Determinants of menstrual hygiene among adolescent girls: A multivariate analysis. *National Journal of Community Medicine, 3*(2), 294-301.

Svare, J. A., Schmidt, H., Hansen, B. B., & Lose, G. (2006). Bacterial vaginosis in a cohort of Danish pregnant women: prevalence and relationship with preterm delivery, low birth weight and perinatal infections. *An International Journal of Obstetrics and Gynaecology, 113*(12), 19-25.

The World Bank. (2018). *Menstrual hygiene management enables women and girls to reach their full potential*. https://www.worldbank.org/en/news/feature/2018/05/25/menstrual-hygiene-management

United Nations Educational, Scientific and Cultural Organization [UNESCO], (2013). *Youth and skills: Putting education to work*. Paris, France: United Nations Educational, Scientific and Cultural Organization.

Upashe, S.P., Tekelab, T., & Mekonnen, J. (2015). Assessment of knowledge and practice of menstrual hygiene among high school girls in Western Ethiopia *BMC Women's Health 15*, 84 Doi 10.1186/s12905-015-0245-7

Varghese, M., Ravichandran, L., & Anandhan, A. K. (2015). Knowledge and practice of menstrual hygiene among adolescent girls. *Indian Journal of Youth & Adolescent Health, 2,* 3.

Zegeye, D. T., Megaiaw, B., & Mulu, A. (2009). Age at menarche and the menstrual pattern of secondary school adolescents in Northwest Ethiopia. *BMC Women's Health, 9,* 29.