INTERNATIONAL JOURNAL OF MEDICAL SCIENCE AND PUBLIC HEALTH RESEARCH (ISSN – 2767-3774)
VOLUME 05 ISSUE 12 Pages: 15-36
OCLC –1242424495

International Journal of Medical Science and Public Health Research

Journal Website: https://ijmsphr.com/index.php/ijmsphr

Research Article

MENSTRUAL HEALTH KNOWLEDGE AMONG ADOLESCENT GIRLS IN SOUTHEASTERN NIGERIA

Submission Date: November 25, 2024, **Accepted Date:** November 30, 2024,
Published Date: December 10, 2024
Crossref Doi: https://doi.org/10.37547/ijmsphr/Volume05Issue12-03

Mowah Onyinye Ngozi, MBBS
Nnamdi Azikiwe University Teaching Hospital (NAUTH), Nnewi, Nigeria

Obohwemu Oberhiri Kennedy, PhD
Department of Health, Wellbeing & Social Care, Global Banking School/Oxford Brookes University, Birmingham, United Kingdom; and PENKUP Research Institute, Birmingham, United Kingdom

Corresponding Author: Obohwemu Oberhiri Kennedy, PhD

ABSTRACT

Background:- Menstrual hygiene management is a critical aspect of reproductive health, particularly for women and girls who are vulnerable to reproductive tract infections during menstruation. This study aimed to investigate the knowledge and practices of menstrual hygiene among secondary school girls in Nnewi, South-Eastern Nigeria. This descriptive cross-sectional study aimed to determine the knowledge of menstrual hygiene among secondary school girls in Nnewi, South-Eastern Nigeria. Specifically, the study sought to investigate the sources of information on menstrual hygiene, the level of knowledge and practices of menstrual hygiene, and the associations between these variables.

Methodology: - The study employed a multistage sampling technique to select 320 female secondary school students in Nnewi, South-Eastern Nigeria. Data was collected using self-administered questionnaires and analysed using SPSS V.22. Statistical associations between variables were tested using Chi square at p-value < 0.05.

Results:- The study found that 65.6% of the respondents were in the 14-17 years age group, and 91.3% had heard of menstruation prior to menarche. Most respondents (63.4%) reported receiving information on menstrual hygiene from their mothers, followed by school (27.1%), friends/peers (7.5%), and media sources (1.4%). The study revealed that 88.8% of the respondents had good knowledge of menstrual hygiene, and 92.5% had good practices of menstrual

INTERNATIONAL JOURNAL OF MEDICAL SCIENCE AND PUBLIC HEALTH RESEARCH (ISSN – 2767-3774)
VOLUME 05 ISSUE 12 Pages: 15-36
OCLC –1242424495

hygiene. There were statistically significant associations between the level of knowledge and the practice of menstrual hygiene ($p < 0.01$), as well as between age and year of study and the practice of menstrual hygiene ($p < 0.01$).

Conclusion:- This study highlights the importance of mothers as a primary source of information on menstrual hygiene for secondary school girls in Nnewi, South-Eastern Nigeria. The study also reveals high levels of knowledge and good practices of menstrual hygiene among secondary school girls in the region. These findings have implications for the development of effective menstrual hygiene education programs that can be tailored to the specific needs and contexts of secondary school girls in Nnewi and other similar regions.

KEYWORDS

Menstrual hygiene, knowledge, secondary school girls, Nnewi, South-Eastern Nigeria.

INTRODUCTION

Menstruation, often referred to by various euphemisms such as menses, period, flow, or bleeding, is a universal physiological process characterized by periodic vaginal bleeding due to the shedding of the uterine mucosa. This natural phenomenon occurs in nearly all women of reproductive age worldwide, representing a key aspect of female reproductive health. Despite its ubiquity, menstruation has historically been misunderstood, misrepresented, and enveloped in stigma and shame. This lack of understanding often extends to adolescent girls, particularly in developing regions like Nigeria, where traditional and cultural barriers exacerbate misinformation and hinder open discussions[1,2]. Proper knowledge about menstruation and its associated health implications is essential for women to safeguard their health and well-being. Misconceptions and lack of accurate information can lead to emotional distress, psychological challenges, and health issues such as urinary tract infections (UTIs), pelvic inflammatory diseases (PIDs), and secondary infertility[3,4]. Therefore, education on the physiological and hygienic aspects of menstruation is crucial to fostering informed decision-making and promoting positive health outcomes[5,6].

The historical understanding of menstruation has been fraught with misconceptions. In the early 20th century, the concept of "menotoxins" perpetuated the belief that menstruating women emitted harmful substances capable of destroying crops and food supplies[7]. These misconceptions reflect the broader societal tendency to mystify natural biological processes, especially those unique to women[8]. Research by historians such as Professor Helen King highlights that information on menstruation in early societies is scarce, likely because male scribes dominated medieval literature, and discussions about women's reproductive health were considered socially inappropriate[9]. Historian Sara Read's research into early modern England suggests that women in pre-modern times often lacked access to sanitary materials, leading them to bleed freely or rely on rudimentary methods such as using rags or pieces of cloth[10]. This lack of suitable menstrual products often marginalized menstruating women, subjecting them to social exclusion or requiring them to undergo purification rituals before reintegrating into their communities[11].

The evolution of menstrual products over the centuries—from rags to menstrual belts, and later to

INTERNATIONAL JOURNAL OF MEDICAL SCIENCE AND PUBLIC HEALTH RESEARCH (ISSN – 2767-3774)
VOLUME 05 ISSUE 12 Pages: 15-36
OCLC –1242424495

disposable pads and tampons—reflects advancements in hygiene and medical science[12]. However, access to these products remains inequitable, particularly in developing countries[7]. This inequity underscores the importance of understanding not only the biological underpinnings of menstruation but also the sociocultural and economic barriers that affect menstrual hygiene management (MHM)[13]. Menstruation is governed by hormonal cycles involving the hypothalamus, pituitary gland, and ovaries. Gonadotropin-releasing hormone (GnRH), secreted by the hypothalamus at the onset of puberty, stimulates the pituitary gland to release follicle-stimulating hormone (FSH) and luteinizing hormone (LH)[12]. These hormones regulate ovarian follicle development and prepare the endometrial lining for potential pregnancy[7].

The menstrual cycle comprises three main phases:

- **Proliferative Phase:** During this phase, oestrogen stimulates the growth of the endometrial lining, enhancing blood supply and preparing the uterus for embryo implantation[14].
- **Secretory Phase:** Progesterone, released under the influence of LH, further develops the endometrial lining and increases secretions to nourish a potential embryo[12].
- **Menstrual Phase:** If pregnancy does not occur, hormone levels drop, leading to the shedding of the endometrial lining. This results in menstruation, which typically lasts 2-7 days, with an average blood loss of 30-80 ml[16].

These physiological processes occur cyclically, exposing women to both hormonal fluctuations and the risk of complications such as anaemia or infections if menstrual hygiene is poorly managed[17]. Menstrual hygiene management (MHM) encompasses the use of clean and safe menstrual materials, access to adequate sanitation facilities, and proper disposal methods[12]. The importance of MHM cannot be overstated, as poor hygiene practices can lead to significant health risks, including reproductive tract infections and other complications[18]. In low- and middle-income countries, barriers to effective MHM include a lack of accurate information, inadequate facilities, and limited access to affordable sanitary products[14]. The concept of "period poverty" captures this challenge, as many women and girls are unable to afford menstrual supplies, leading to absenteeism from school, social stigma, and reduced opportunities for empowerment[19].

Efforts to improve MHM must address these systemic challenges through education, provision of affordable products, and the development of supportive policies[20]. In India, for instance, only 12% of menstruators have access to sanitary products, a figure that underscores the global scale of this issue[21]. Similarly, in sub-Saharan Africa, 1 in 10 girls misses school during menstruation due to lack of supplies[22]. Knowledge about menstruation is foundational to ensuring effective MHM. Studies across various regions highlight that the primary source of information for adolescent girls is often their mothers[23]. However, the accuracy and depth of information provided depend significantly on maternal education levels[24]. Girls whose mothers have attained secondary or higher education are more likely to have accurate knowledge of menstruation and hygiene practices[25].

This knowledge gap is particularly pronounced in lower socioeconomic strata, where limited access to education perpetuates misinformation. For instance, in Ethiopia, 51.8% of surveyed girls believed menstruation was caused by disease, while only 6% understood it as

INTERNATIONAL JOURNAL OF MEDICAL SCIENCE AND PUBLIC HEALTH RESEARCH (ISSN – 2767-3774)
VOLUME 05 ISSUE 12 Pages: 15-36
OCLC –1242424495

a physiological process[26]. Such misconceptions can have far-reaching implications for the health and self-esteem of young women. In Nigeria, where educational attainment for women varies significantly by region and socioeconomic status, addressing this knowledge gap is critical. Girl-child education and women's empowerment initiatives can play a pivotal role in equipping mothers and daughters with accurate information, fostering healthier practices, and breaking cycles of misinformation[27].

Adolescence, defined by the World Health Organization (WHO) as the period between 10 and 19 years[28], is a critical phase marked by rapid physical, emotional, and social changes. Menarche, the onset of menstruation, is a significant milestone during this period. However, poor MHM among adolescents is associated with various challenges, including reproductive tract infections, social exclusion, and educational disruptions.

In Nigeria, where 37 million women and girls face period poverty[29], the situation is particularly dire. High costs of menstrual products, coupled with inadequate education and cultural stigmas, contribute to a widespread lack of proper hygiene practices. This issue is exacerbated by policies such as high taxes on menstrual products, which place these essential items out of reach for many families[30].

Addressing these challenges requires a multifaceted approach that prioritizes education, affordability, and accessibility. Research into the knowledge and practices of secondary school girls in Southeastern Nigeria can provide valuable insights into the sociocultural and economic determinants of MHM, informing interventions to improve outcomes for this vulnerable population.

Menstruation is a universal aspect of female biology, yet its management remains a significant challenge, particularly in low resource settings[31]. Adolescence is a critical period for establishing lifelong health behaviours, and equipping young girls with accurate knowledge about MHM can have profound implications for their reproductive health and overall well-being.

Peer influence, cultural norms, and socioeconomic factors play significant roles in shaping girls' knowledge and practices[32]. By investigating these dynamics among secondary school girls in Southeastern Nigeria, this study aims to contribute to the broader understanding of MHM in the region. The findings will not only shed light on current practices but also inform strategies to address period poverty, reduce health risks, and promote gender equality.

This research aims to determine the knowledge of menstrual hygiene amongst secondary school girls in Nnewi, South-Eastern Nigeria. The study is guided by the following research questions:

1. What do secondary school girls in Southeastern Nigeria, particularly in Nnewi, know about menstrual hygiene?
2. What are the primary sources of information about menstruation and MHM for these girls?
3. What are the common menstrual hygiene practices among secondary school girls in Nnewi?
4. How do sociodemographic variables influence MHM practices in this population?

METHODOLOGY

STUDY AREA

INTERNATIONAL JOURNAL OF MEDICAL SCIENCE AND PUBLIC HEALTH RESEARCH (ISSN – 2767-3774)
VOLUME 05 ISSUE 12 Pages: 15-36
OCLC –1242424495

The study was conducted in Nnewi, Anambra State, Nigeria. Nnewi is a commercial and industrial city known for its vibrant auto industry. It is the second largest and second most populated city in Anambra State, with a population of 391,227 as of the 2002 Nigerian Census, and over 900,000 according to a 2019 population estimate.[33] Incorporated as a city on 27th August 1991, Nnewi as a metropolis has one local government area, Nnewi North. Nnewi North comprises four quarters: Otolo, Uruagu, Umudim and Nnewichi.

STUDY DESIGN

The study was a descriptive cross-sectional survey conducted among female high school students in Nnewi, South-Eastern Nigeria.

STUDY POPULATION

The study population comprised adolescent schoolgirls between the ages of 10-19 in selected secondary schools in Nnewi.

INCLUSION CRITERIA

Female adolescent high school students in Nnewi who had attained menarche.

EXCLUSION CRITERIA

Female adolescent high school students in Nnewi who were not willing to participate in the study, as well as those who were absent from school at the time of study were excluded.

SAMPLE SIZE DETERMINATION

The sample size for this study was determined using the formula:[34]

$$N = \frac{Z^2 PQ}{D^2}$$

Where:

N = Sample size if population is >10,000

Z^2 = Standard normal deviation usually 1.96

P = Prevalence of 0.25 [35]

Q = 1 - P = 0.75

D = Level of precision required = 0.05

Thus,

$N = 1.96^2 * 0.25 * 0.75 / 0.05^2$

N= 288

Therefore, assuming a non-response rate (f) of 10%, the adjusted sample size (Ns)

$$Ns = N/1\text{-}f = \frac{288}{1-0.1} = \frac{288}{0.9} = 320$$

SAMPLING TECHNIQUE

The intended participants were selected using a multi-stage sampling technique.

Stage One: Simple random sampling was used to select two communities (Nnewichi and Uruagu) from the list of four communities within Nnewi North Local Government Area. A comprehensive list of the secondary schools within Nnewi North LGA was obtained from the Local Government Office (unpublished).

INTERNATIONAL JOURNAL OF MEDICAL SCIENCE AND PUBLIC HEALTH RESEARCH (ISSN – 2767-3774)
VOLUME 05 ISSUE 12 Pages: 15-36
OCLC –1242424495

Stage Two: Selection of Schools. A stratified sampling technique was used to group the secondary schools within Nnewi into public and private. The ratio of public to private schools in Nnewi was then calculated based on this stratification thus:

Total Number of Secondary Schools: 55

Total Number of Public Schools: 8

Total Number of Private Schools: 47

The ratio of public to private schools was therefore 1:6.

Stage Three: Selection of Schools. Simple random sampling was used to select two public schools and twelve private schools respectively out of the secondary schools within the two communities. Each of the schools was stratified by class into six groups: JSS1- SSS3.

Stage Four: Selection of Participants. Proportional allocation was used to determine the total number of participants to be interviewed per class. Systematic random sampling was then used to select the students to participate in the study.

SAMPLING INSTRUMENT

All participants fitting into the eligibility criteria were given a self-administered structured questionnaire with relevant questions adapted from previous studies.[36, 37, 38] Respondents who had trouble with the questionnaire were duly assisted by the researcher. The questionnaire was divided into 3 sections: A, B and C. Section A assessed the socio-demographic profile of the respondents. Section B assessed the knowledge of menstrual hygiene, and Section C assessed the practice of menstrual hygiene, as well as factors affecting these practices.

Students' menstrual knowledge score was calculated out of the 10 knowledge specific questions. Each correct response earned one point, whereas wrong responses attracted no point. Students who scored greater than or equal to the mean value were considered as having good knowledge of menstrual hygiene. Those respondents whose computed scores were less than the mean value were considered as having poor knowledge.

The practice of menstrual hygiene was assessed through the practice specific questions. Each correct response earned one point, whereas wrong responses attracted no point. Students who scored greater than or equal to the mean value were considered as having good practice of menstrual hygiene. Those respondents whose computed scores were less than the mean value were considered as having poor practice of menstrual hygiene.

DATA COLLECTION METHODS

The questionnaire instrument was distributed and collected with the help of four trained research assistants who are fluent in both English and Igbo languages to enable proper interpretation of the questionnaire where necessary.

DATA ANALYSIS

The Statistical Package for the Social Sciences (SPSS) v.22.0 was used for analysis of the data. The findings were presented in frequency tables and charts where necessary. The level of significance was set at 5%.

DURATION OF STUDY

INTERNATIONAL JOURNAL OF MEDICAL SCIENCE AND PUBLIC HEALTH RESEARCH (ISSN – 2767-3774)
VOLUME 05 ISSUE 12 Pages: 15-36
OCLC –1242424495

The research was carried out over a period of four weeks (November – December 2022) from the date of ethical.

ETHICAL CONSIDERATION

Ethical approval to carry out this study was obtained from the Ethical Committee of Nnamdi Azikiwe University Teaching Hospital, (NAUTHEC) Nnewi. Approval of the study was also obtained from the principals of the respective schools. Informed verbal consent was sought from each student, and only those who consented were interviewed. Respondents were assured of anonymity and confidentiality of their responses.

STUDY LIMITATIONS

The study relied on a cross-sectional study design. Therefore, it was difficult to establish causal inferences about relationships between the outcome and the variables assessed in the study. Also, owing to the sensitive nature of the study, there was the potential for social desirability bias amongst participants, particularly amongst the practice specific questions. Participants were, however, reassured that their responses were confidential, and would not be traceable to them.

RESULTS

Table 1. shows that an overwhelming percentage of respondents' parents (mothers: 88.4%; fathers: 81.0%) were educated up to at least SSCE level.

TABLE 1.: SOCIODEMOGRAPHIC CHARACTERISTICS OF RESPONDENTS

Characteristics		*Frequency*	*Percentage (%)*
Age	<10 years	8	2.5
	11-13 years	100	31.3
	14-17 years	210	65.6
	18-20 years	2	0.6
	Total	**320**	**100.0**
Year of study	JSS 1	39	12.2
	JSS 2	44	13.8
	JSS 3	80	25
	SS 1	26	8.1
	SS 2	59	18.4
	SS 3	72	22.5
	Total	**320**	**100.0**
Tribe	Igbo	313	97.8
	Hausa	5	1.6

INTERNATIONAL JOURNAL OF MEDICAL SCIENCE AND PUBLIC HEALTH RESEARCH (ISSN – 2767-3774)
VOLUME 05 ISSUE 12 Pages: 15-36
OCLC –1242424495

	Yoruba	1	0.3
	Idoma	1	0.3
	Total	**320**	**100.0**
Religion	Christianity	319	99.7
	Islam	1	0.3
	Total	**320**	**100.0**
Father/Guardian's HLE	No formal education	58	18.1
	SSCE	153	47.8
	OND/HND	27	8.4
	Bachelor's Degree	38	11.9
	Master's Degree	28	8.8
	PhD	16	5
	Total	**320**	**100.0**
Mother/Caregiver's HLE	No formal education	37	11.6
	SSCE	135	42.2
	OND/HND	47	14.7
	Bachelor's Degree	44	13.8
	Master's Degree	42	13.1
	PhD	15	4.7
	Total	**320**	**100.0**
Father's Occupation	Trader	174	54.4
	Commercial driver	33	10.3
	Banker	12	3.8
	Lawyer	7	2.2
	Doctor	19	5.9
	Engineer	23	7.2
	Civil servant	36	11.3
	Other	16	5
	Total	**320**	**100.0**
Mother's Occupation	Housewife	16	5
	Trader	193	60.3
	Healthcare worker	30	9.4
	Banker	15	4.7

INTERNATIONAL JOURNAL OF MEDICAL SCIENCE AND PUBLIC HEALTH RESEARCH (ISSN – 2767-3774)
VOLUME 05 ISSUE 12 Pages: 15-36
OCLC –1242424495

	Lawyer	5	1.6
	Engineer	2	0.6
	Civil servant	47	14.7
	Other	12	3.8
	Total	**320**	**100.0**
Current Place of Residence	With parents	278	86.9
	Other relatives	35	10.9
	None relatives	7	2.2
	Total	**320**	**100.0**

Table 2. shows that the mean age at menarche was 12.3 years.

TABLE 2.: DISTRIBUTION OF AGE OF MENARCHE

Age at menarche (years)	*Frequency*	*Percentage (%)*
9	2	0.6
10	10	3.1
11	69	21.6
12	101	31.6
13	91	28.4
14	40	12.5
15	7	2.2
Mean	**12.3**	
StD	**1.13**	

Table 3. above shows that of the 91.3% of respondents who had knowledge of menstruation prior to menarche, 63.4% had their primary source of information as their mothers.

TABLE 3.: KNOWLEDGE OF MENSTRUAL HYGIENE

		Frequency	**Percent**
Had prior knowledge of menstruation before menarche	**Yes**	292	91.3
Knowledge source	*Mother*	*185*	*63.4*
	Friends/peers	*22*	*7.5*
	School	*79*	*27.1*
	Media sources	*4*	*1.4*

INTERNATIONAL JOURNAL OF MEDICAL SCIENCE AND PUBLIC HEALTH RESEARCH (ISSN – 2767-3774)
VOLUME 05 ISSUE 12 Pages: 15-36
OCLC –1242424495

	No	28	8.8
Menstruation is a normal process in women	Yes	308	96.3
	No	4	1.3
	Don't know	8	2.5
Cause of menstruation is	Infection	8	2.5
	Hormones	240	75.0
	Curse	23	7.2
	Don't know	49	15.3
Menstrual blood comes from	Stomach	12	3.8
	Ovary	145	45.3
	Uterus	141	44.1
	Others	22	6.9
How long should a normal period last	2 weeks	3	0.9
	2-7 days	77	24.1
	<5 days	212	66.3
	Don't know	28	8.8
Symptoms of menstruation	Bloating	19	5.9
	Abdominal cramp	156	48.8
	Headache	63	19.7
	Mood swing	34	10.6
	Fever	33	10.3
	Foul smelling discharge	18	5.6
	All of the above	69	21.6
Materials that are safe to use during menstruation	Toilet rolls	8	2.5
	Sanitary pads	304	95.0
	Tampons	6	1.9
	Menstrual cups	1	0.3
	Old rags	1	0.3
How often should sanitary pads be changed	Once daily	6	1.9
	Twice daily	77	24.1

INTERNATIONAL JOURNAL OF MEDICAL SCIENCE AND PUBLIC HEALTH RESEARCH (ISSN – 2767-3774)
VOLUME 05 ISSUE 12 Pages: 15-36
OCLC –1242424495

	Thrice daily	120	37.5
	As necessary	103	32.2
	Don't know	14	4.4
Poor hygiene predisposes to infection	Yes	286	89.4
	No	3	0.9
	Don't know	34	10.6

The figure below shows that most respondents (91%) knew about menstruation before the onset of menarche.

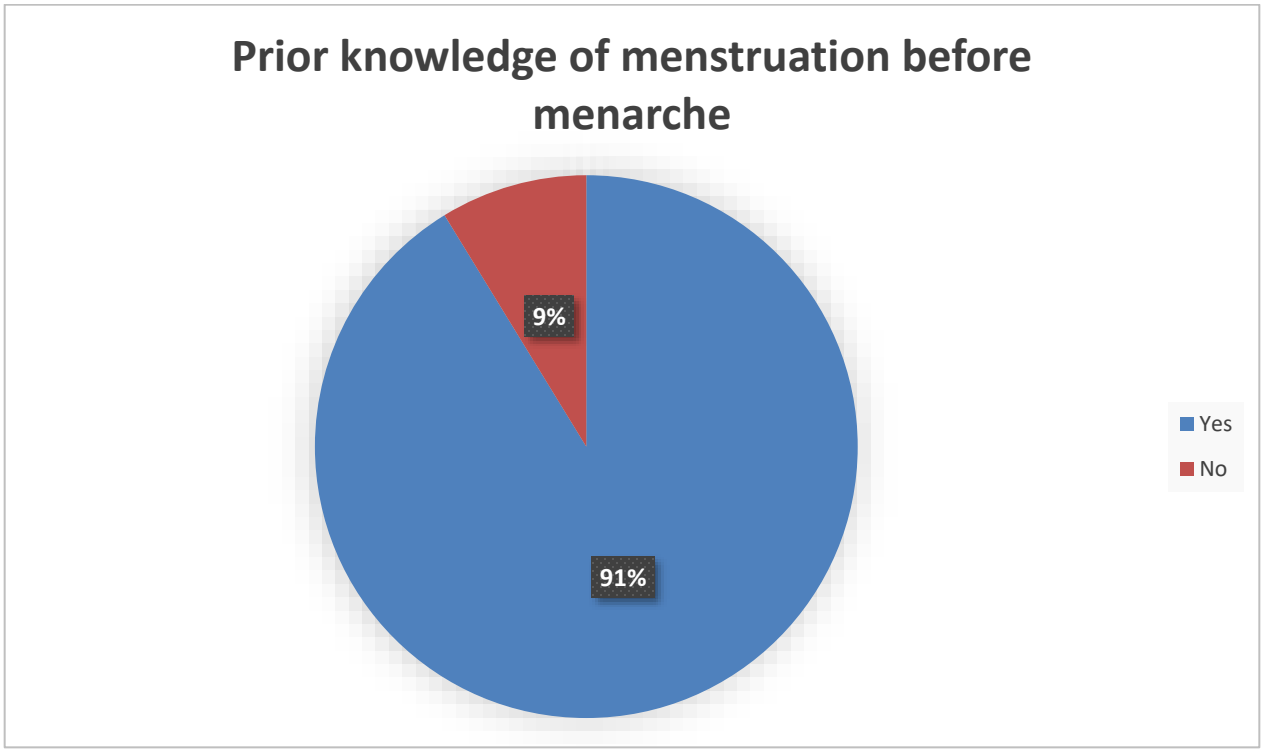

FIGURE 1.: PRIOR KNOWLEDGE OF MENSTRUATION BEFORE MENARCHE

Table 4. and Fig. 2. below shows that an overwhelming percentage of respondents had good knowledge of menstrual hygiene (88.8%).

TABLE 4.: LEVEL OF KNOWLEDGE OF MENSTRUAL HYGIENE

Level		*Frequency*	*Percentage (%)*
Knowledge Level	Poor Knowledge	36	11.3
	Good Knowledge	284	88.8

INTERNATIONAL JOURNAL OF MEDICAL SCIENCE AND PUBLIC HEALTH RESEARCH (ISSN – 2767-3774)
VOLUME 05 ISSUE 12 Pages: 15-36
OCLC –1242424495

Total	**320**	**100**

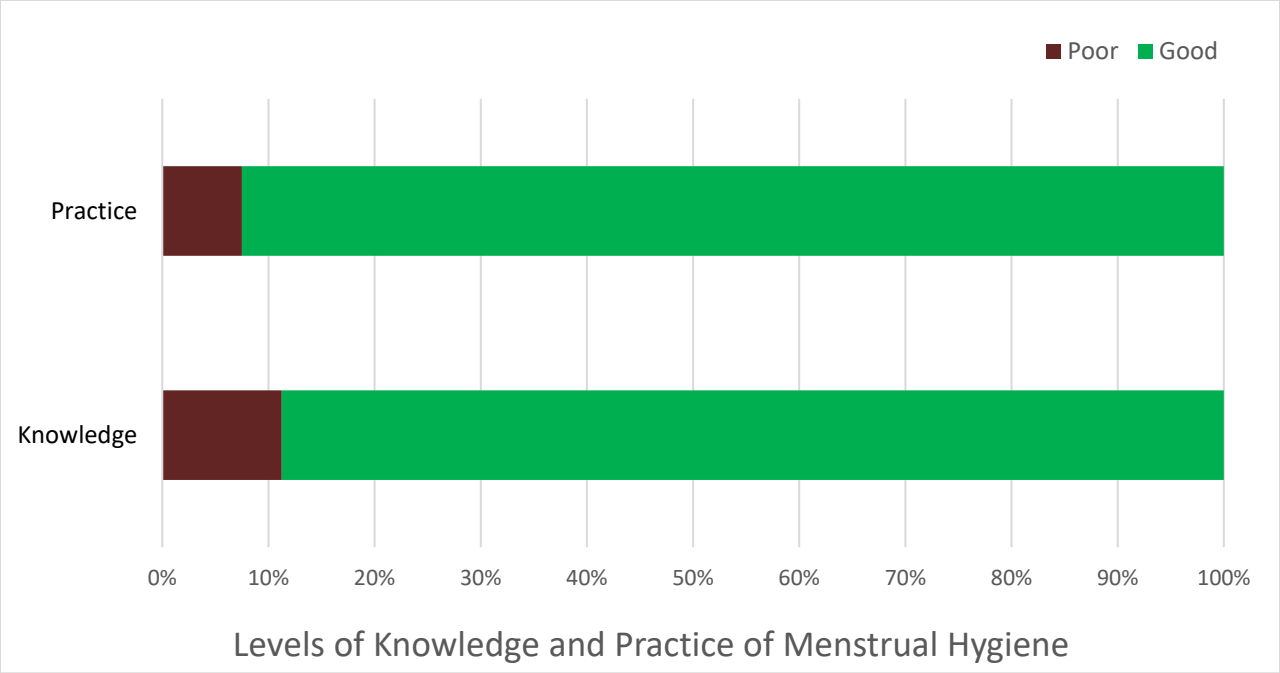

FIGURE 2.: LEVELS OF KNOWLEDGE AND PRACTICE OF MENSTRUAL HYGIENE

Table 4.7 shows a statistically significant relationship between Knowledge and Practice of Menstrual Hygiene (X^2 = 47.86, p= <0.01).

TABLE 5.: RELATIONSHIP BETWEEN KNOWLEDGE AND PRACTICE OF MENSTRUAL HYGIENE

Variable		**Practice**				
		Poor	Good	Total	X^2	p-value
Knowledge Level	Poor	13(36.1)	23(63.9)	36(100)	47.86	<0.01
	Good	11(3.9)	273(96.1) *	284(100)		
	Total	**24(7.5)**	**296(92.5)**	**320(100)**		

* = statistically significant (p< 0.05 is significant)

INTERNATIONAL JOURNAL OF MEDICAL SCIENCE AND PUBLIC HEALTH RESEARCH (ISSN – 2767-3774)
VOLUME 05 ISSUE 12 Pages: 15-36
OCLC –1242424495

Table 6. shows that there was a statistically significant relationship between some personal demographic variables and the level of knowledge on menstrual hygiene.

TABLE 6.: RELATIONSHIP BETWEEN KNOWLEDGE AND PERSONAL DEMOGRAPHICS OF RESPONDENTS

Personal Demographic Variables		Knowledge level				
		Poor	Good	Total	X^2	p-value
Age	<10	4(50)*	4(50)	8(100)	19.14	<0.01
	11-13	17(17)	83(83)	100(100)		
	14-17	15(7.1)	195(92.9)*	210(100)		
	18-20	0(0)	2(100)	2(100)		
Year of study	JSS 1	12(30.8)*	27(69.2)	39(100)	22.55	<0.01
	JSS 2	6(13.6)	38(86.4)	44(100)		
	JSS 3	7(8.8)	73(91.3)	80(100)		
	SS 1	1(3.8)	25(96.2)	26(100)		
	SS 2	8(13.6)	51(86.4)	59(100)		
	SS 3	2(2.8)	70(97.2)*	72(100)		
Tribe	Igbo	35(11.2)	278(88.8)	313(100)	0.64	0.89
	Hausa	1(20)	4(80)	5(100)		
	Yoruba	0(0)	1(100)	1(100)		
	Idoma	0(0)	1(100)	1(100)		
Religion	Christianity	36(11.3)	283(88.7)	319(100)	0.13	0.72
	Islam	0(0)	1(100)	1(100)		

* = Statistically significant p< 0.05 is significant

Table 7 shows that there is no statistically significant relationship between parents' demographics and the knowledge of menstrual hygiene.

TABLE 7.: RELATIONSHIP BETWEEN PARENTS' DEMOGRAPHICS AND KNOWLEDGE OF MENSTRUATION

		Knowledge level				
		Poor	Good	Total	X^2	p-value
Father/guardian's HLE	No formal education	5(8.6)	53(91.4)	58(100)	6.27	0.29
	SSCE	13(8.5)	140(91.5)	153(100)		

INTERNATIONAL JOURNAL OF MEDICAL SCIENCE AND PUBLIC HEALTH RESEARCH (ISSN – 2767-3774)
VOLUME 05 ISSUE 12 Pages: 15-36
OCLC –1242424495

	OND/HND	6(22.2)	21(77.8)	27(100)		
	Bachelor's degree	5(13.2)	33(86.8)	38(100)		
	Masters	5(17.9)	23(82.1)	28(100)		
	PhD	2(12.5)	14(87.5)	16(100)		
Mother/caregiver HLE	No formal	5(13.5)	32(86.5)	37(100)	0.54	0.99
	SSCE	15(11.1)	120(88.9)	135(100)		
	OND/HND	5(10.6)	42(89.4)	47(100)		
	Bachelor's degree	5(11.4)	39(88.6)	44(100)		
	Masters	5(11.9)	37(88.1)	42(100)		
	PhD	1(6.7)	14(93.3)	15(100)		
Father's occupation	Trader	18(10.3)	156(89.7)	174(100)	5.19	0.64
	Commercial driver	7(21.2)	26(78.8)	33(100)		
	Banker	1(8.3)	11(91.7)	12(100)		
	Lawyer	0(0)	7(100)	7(100)		
	Doctor	1(5.3)	18(94.7)	19(100)		
	Engineer	3(13)	20(87)	23(100)		
	Civil servant	4(11.1)	32(88.9)	36(100)		
	Other	2(12.5)	14(87.5)	16(100)		
Mother's occupation	Housewife	2(12.5)	14(87.5)	16(100)	15.92	0.26
	Trader	22(11.4)	171(88.6)	193(100)		
	Healthcare worker	0(0)	30(100)	30(100)		
	Banker	1(6.7)	14(93.3)	15(100)		
	Lawyer	1(20)	4(80)	5(100)		
	Engineer	0(0)	2(100)	2(100)		
	Civil servant	5(10.6)	42(89.4)	47(100)		
	Other	5(41.7)	7(58.3)	12(100)		
Current place of residence	With parents	28(10.1)	250(89.9)	278(100)	3.14	0.29
	Other relatives	7(20)	28(80)	35(100)		
	No related	1(14.3)	6(85.7)	7(100)		

* = Statistically significant p< 0.05 is significant

INTERNATIONAL JOURNAL OF MEDICAL SCIENCE AND PUBLIC HEALTH RESEARCH (ISSN – 2767-3774)
VOLUME 05 ISSUE 12 Pages: 15-36
OCLC –1242424495

DISCUSSION

This study explores the knowledge surrounding menstrual hygiene among high school girls in Nnewi, South-Eastern Nigeria, focusing on the factors that influence understanding and awareness of menstrual hygiene management (MHM). Knowledge encompasses not only the recognition of menstruation as a physiological process but also the understanding of how to manage it safely and hygienically[39,40]. This exploration reveals patterns, determinants, and gaps in menstrual health education, providing insights into the cognitive and informational dimensions of MHM[41].

The preference for sanitary pads as the dominant menstrual hygiene product reflects a significant level of awareness among respondents. This aligns with findings in India, Ethiopia, and Osogbo, Nigeria, suggesting a growing recognition of the benefits of using commercially produced menstrual products[42,43]. Campaigns and educational programs emphasizing the advantages of sanitary pads—such as their hygiene, convenience, and comfort—have likely contributed to this knowledge[44]. Moreover, the role of family education, particularly among parents with at least secondary-level education, is critical in disseminating accurate information about menstruation and menstrual products[45]. However, the limited use of less conventional alternatives like toilet rolls or cloth underscores disparities in awareness that may be linked to economic and cultural variations[46].

Awareness about the importance of frequent menstrual product changes illustrates a foundational level of knowledge in the community. Studies from Ethiopia and other parts of Nigeria corroborate the understanding of risks associated with prolonged use of menstrual products[46,47]. This indicates that health education campaigns have been successful in highlighting the connection between hygienic practices and health outcomes[41]. Nonetheless, the persistence of misconceptions, such as the sufficiency of infrequent changes, points to gaps in the depth and accessibility of knowledge, particularly among populations facing financial constraints[48].

The understanding of proper menstrual waste disposal methods is another dimension of MHM knowledge that reflects educational outreach efforts. Respondents' awareness of the importance of hygienic disposal methods, such as wrapping and binning used products, mirrors findings from other urbanized areas[44,49]. The dissemination of information about the environmental and health implications of improper disposal practices, such as open dumping or flushing products, has likely contributed to a baseline understanding[50]. Nevertheless, gaps remain, as evidenced by the prevalence of less hygienic disposal methods[51]. These gaps highlight the need for ongoing educational campaigns to bridge knowledge deficits, especially in areas where infrastructure to support proper disposal may be lacking[45].

The study also emphasizes the importance of personal hygiene knowledge, specifically regarding washing and cleanliness during menstruation. Respondents demonstrated an understanding of the role of clean water and soap in maintaining hygiene and preventing infections. This knowledge is often linked to broader public health initiatives that emphasize the interplay

INTERNATIONAL JOURNAL OF MEDICAL SCIENCE AND PUBLIC HEALTH RESEARCH (ISSN – 2767-3774)
VOLUME 05 ISSUE 12 Pages: 15-36
OCLC –1242424495

between hygiene and health outcomes[52]. However, the challenges posed by inadequate water supply and the lack of private washing facilities in schools reveal structural barriers to translating this knowledge into consistent practice, underscoring the need for systemic improvements to reinforce educational gains[41].

Sociodemographic factors, such as age and educational level, significantly influence knowledge acquisition. Older students and those in higher grades exhibited a more comprehensive understanding of menstrual health, likely due to cumulative exposure to health education curricula and peer discussions. This trend aligns with findings in Southern Ethiopia, where educational progression correlates with greater menstrual health knowledge[41]. Younger students and those in lower grades, by contrast, may encounter informational gaps due to limited access to structured education on menstruation and the stigma that can inhibit open discussions[53]. This emphasizes the need for targeted educational initiatives to ensure that younger cohorts receive accurate and age-appropriate information[54].

Cultural and social factors deeply impact the dissemination and quality of menstrual health knowledge. Mothers traditionally serve as primary educators on menstruation in many African societies, including Nnewi[55]. Their role is pivotal in transmitting foundational knowledge to their daughters, shaping their understanding of menstruation and its management[44]. However, cultural taboos and myths surrounding menstruation can limit the accuracy and depth of this knowledge transfer[50]. Studies in Pakistan, Ethiopia, and other parts of Nigeria suggest that these taboos perpetuate misinformation, especially among mothers with limited formal education[54]. Addressing these generational gaps in knowledge through community engagement and empowerment programs is essential to fostering a more informed understanding of menstruation[45].

Peer interactions play a dual role in the exchange of menstrual health knowledge. On one hand, peers serve as a crucial source of information, sharing insights about menstrual products and management strategies[51]. On the other hand, peer groups can perpetuate misinformation or reinforce harmful cultural norms if not guided by accurate knowledge[56]. Adolescents' susceptibility to peer influence highlights the importance of creating structured platforms for peer education, where correct information can be disseminated and misconceptions addressed effectively[57].

Economic factors also shape knowledge acquisition and dissemination. Period poverty, defined as the inability to afford menstrual products, not only limits access to hygienic options but also impacts the breadth of knowledge about alternative solutions[41]. While economic barriers are often discussed in terms of their practical implications, they also contribute to gaps in understanding as families facing financial constraints may lack exposure to comprehensive menstrual health education[52]. Advocacy for affordable menstrual products and policies promoting access to accurate information are essential to mitigating these knowledge disparities[48].

The school environment is a critical determinant of menstrual health knowledge. Schools serve as primary sites for formal health education, where girls are introduced to the biological, social, and hygienic aspects of menstruation[47]. Respondents demonstrated an awareness of the importance of clean and private facilities for menstrual management, reflecting the influence of school-based educational

initiatives[31]. However, the disparity in knowledge between students in well-equipped schools and those in under-resourced institutions underscores the role of infrastructural and systemic inequalities in shaping educational outcomes[42].

The health implications of inadequate menstrual health knowledge are profound. Limited understanding of the connection between menstruation, hygiene, and health can increase vulnerability to infections and other complications[43]. Moreover, the psychological impact of stigma and misinformation surrounding menstruation can lead to long-term consequences for mental well-being. Educational programs that emphasize the link between menstrual health and overall physical and mental health are critical in equipping girls with the knowledge necessary to navigate menstruation confidently and safely.

This study underscores the importance of a multi-dimensional approach to improving menstrual health knowledge. While significant strides have been made in raising awareness, gaps remain in ensuring that all girls have access to accurate, comprehensive, and culturally sensitive information about menstruation. Community education, targeted school-based interventions, and policy changes aimed at integrating menstrual health into broader public health initiatives are crucial steps in bridging these knowledge gaps. Through concerted efforts, it is possible to create an environment where menstrual health knowledge becomes universally accessible, fostering a generation of girls empowered to manage their menstruation with confidence and dignity.

CONCLUSION

This study revealed good menstrual health knowledge among adolescent girls in Nnewi, but it also underscores the need for continued efforts to address gaps and challenges. Significant correlations exist between certain sociodemographic variables and this knowledge. Factors such as age, education, socioeconomic status, and school environments play significant roles in shaping menstrual health knowledge. Mothers are the primary source of information regarding menstrual hygiene for most high school girls in the study. Therefore, it is important to emphasize female empowerment and education, as maternal literacy levels can significantly affect menstrual health knowledge among high school girls. Implementing targeted interventions and fostering supportive environments ensures that all girls have the resources and infrastructure necessary for safe and dignified menstrual hygiene management. Educational programs should focus on providing accurate and comprehensive information about menstruation, addressing cultural taboos, and promoting open discussions. Schools should be equipped with the necessary facilities and resources to support menstrual health education and management. The collective impact of these efforts will not only improve health outcomes but also empower girls to achieve their full potential in education and beyond. Ensuring that girls have access to accurate menstrual health knowledge is crucial for their overall well-being and development. Addressing the identified gaps and challenges creates a more informed and supportive environment for adolescent girls in Southeastern Nigeria.

CONFLICTS OF INTEREST

The publication of this article was supported by PENKUP Foundation, a non-profit organisation founded by the author. The other author has no conflict of interest to declare.

FUNDING

This work was supported by the PENKUP Foundation, a division of PENKUP International, which provided funding for the publication of this article.

ACKNOWLEDGMENT

The authors would like to acknowledge the management and technical staff of PENKUP Research Institute, Birmingham, UK, for their excellent assistance and for providing medical writing and editorial support in accordance with Good Publication Practice (GPP3) guidelines.

REFERENCES

1. Alekhya, G., Sahu, D.P. and Behera, P., 2023. The top 100 cited articles in menstrual health among adolescent girls: a citation analysis. *Reproductive Health*, *20*(1), p.118.
2. Jeon, B. and Baek, J., 2023. Menstrual disturbances and its association with sleep disturbances: a systematic review. *BMC Women's Health*, *23*(1), p.470.
3. Jalali, R., 2023. Global Health Priorities and the Neglect of Menstrual Health and Hygiene: The Role of Issue Attributes. *Sociology of Development*, *9*(4), pp.317-345.
4. Betsu, B.D., Medhanyie, A.A., Gebrehiwet, T.G. and Wall, L.L., 2024. Menstrual hygiene management interventions and their effects on schoolgirls' menstrual hygiene experiences in low and middle countries: A systematic review. *Plos one*, *19*(8), p.e0302523.
5. Maulingin-Gumbaketi, E., Larkins, S., Whittaker, M., Rembeck, G., Gunnarsson, R. and Redman-MacLaren, M., 2022. Socio-cultural implications for women's menstrual health in the Pacific Island Countries and Territories (PICTs): a scoping review. *Reproductive health*, *19*(1), p.128.
6. Sugita, E.W., 2022. Gender and Culture Matters: Considerations for Menstrual Hygiene Management. *The Sanitation Triangle*, 65.
7. Robinson, H.J. and Barrington, D.J., 2021. Drivers of menstrual material disposal and washing practices: A systematic review. *Plos one*, *16*(12), p.e0260472.
8. Elledge, M.F., Muralidharan, A., Parker, A., Ravndal, K.T., Siddiqui, M., Toolaram, A.P. and Woodward, K.P., 2018. Menstrual hygiene management and waste disposal in low- and middle-income countries—a review of the literature. *International journal of environmental research and public health*, *15*(11), p.2562.
9. Masturo, N.F. and Prasetyo, B., 2024. Factors Affecting Personal Hygiene Practice During Menstruation: A Literature Review. *Factors Affecting Personal Hygiene Practice During Menstruation: A Literature Review*, *140*(1), pp.3-3.
10. UNICEF, 2019. *Guidance on menstrual health and hygiene* [online] Available at: https://www.unicef.org/media/91341/file/UNICEF-Guidance-menstrual-health-hygiene-2019.pdf, [Accessed: 02/12/2024].
11. Panda, N., Desaraju, S., Panigrahy, R.P., Ghosh, U., Saxena, S., Singh, P. and Panda, B., 2024. Menstrual health and hygiene amongst adolescent girls and women of reproductive age: a study of practices and predictors, Odisha, India. *BMC Women's Health*, *24*(1), p.144.
12. Pednekar, S., Some, S., Rivankar, K. and Thakore, R., 2022. Enabling factors for sustainable menstrual hygiene management practices: a rapid review. *Discover Sustainability*, *3*(1), p.28.
13. Hennegan, J., Brooks, D.J., Schwab, K.J. and Melendez-Torres, G.J., 2020. Measurement in the study of menstrual health and hygiene: A systematic review and audit. *PloS one*, *15*(6), p.e0232935.

14. Hall, N.L. and Creamer, S., 2021. Menstrual Health and Hygiene in Sustainable Development Goal 6. In *Clean Water and Sanitation* (pp. 1-9). Cham: Springer International Publishing.
15. Chidya, R., Kachuma, O., Thole, T., Banda, L., Loewenberger, M. and Nicholson, J., 2024. Evaluation of knowledge, attitude, practices and effectiveness of menstrual hygiene interventions in rural schools from Lilongwe, Malawi. *BMC Public Health*, *24*(1), p.1435.
16. Gujarathi, J. and Asokan, V., 2021. A SYSTEMATIC REVIEW STUDY OF CONTEMPORARY AND HISTORICAL PERSPECTIVE OF MENSTRUAL PRACTICES ACROSS CULTURES. GAP Interdisciplinarities, 4(4): Oct-Nov 2021.
17. Pandey, N., Desul, S., Patra, R.K. and Sethy, M., 2023. Menstrual health and hygiene (MHH): a bibliometric analysis. *Global Knowledge, Memory and Communication*. Available at: https://www.emerald.com/insight/content/doi/10.1108/gkmc-07-2023-0234/full/html, [Accessed: 03/12/2024]
18. Masturo, N.F. and Prasetyo, B., 2024. Factors Affecting Personal Hygiene Practice During Menstruation: A Literature Review. *Factors Affecting Personal Hygiene Practice During Menstruation: A Literature Review*, *140*(1), pp.3-3.
19. Schmitt, M.L., Gruer, C., Clatworthy, D., Kimonye, C., Peter, D.E. and Sommer, M., 2022. Menstrual material maintenance, disposal, and laundering challenges among displaced girls and women in Northeast Nigeria. *Journal of Water, Sanitation and Hygiene for Development*, *12*(7), pp.517-528.
20. IKHAPP. (2024). Tackling plastic pollution at the source through ecofriendly menstruation products. Available at: https:// ikhapp.org/stories-and-research-brief/tackling-plastic-pollution-at-the-source-through-ecofriendly-menstruation-products/, [Accessed: 03/12/2024]
21. Elledge MF, Muralidharan A, Parker A, Ravndal KT, Siddiqui M, Toolaram AP, Woodward KP. Menstrual Hygiene Management and Waste Disposal in Low- and Middle-Income Countries—A Review of the Literature. *International Journal of Environmental Research and Public Health*. 2018; 15(11):2562. https://doi.org/10.3390/ijerph15112562
22. Elledge, M.F., Muralidharan, A., Parker, A., Ravndal, K.T., Siddiqui, M., Toolaram, A.P. and Woodward, K.P., 2018. Menstrual hygiene management and waste disposal in low- and middle-income countries—a review of the literature. *International journal of environmental research and public health*, *15*(11), p.2562. Cranfield University.
23. Olson, M.M., Alhelou, N., Kavattur, P.S., Rountree, L. and Winkler, I.T., 2022. The persistent power of stigma: A critical review of policy initiatives to break the menstrual silence and advance menstrual literacy. *PLOS Global Public Health*, *2*(7), p.e0000070.
24. Munro, A.K., Hunter, E.C., Hossain, S.Z. and Keep, M., 2021. A systematic review of the menstrual experiences of university students and the impacts on their education: a global perspective. *PloS one*, *16*(9), p.e0257333.
25. Anaba EA, Udofia EA, Manu A, Daniels AA, Aryeetey R. Use of reusable menstrual management materials and associated factors among women of reproductive age in Ghana: analysis of the 2017/18 Multiple Indicator Cluster Survey. BMC Women's Health. 2022 Mar 26;22(1):92.
26. Belayneh, Z. and Mekuriaw, B., 2019. Knowledge and menstrual hygiene practice among adolescent schoolgirls in southern Ethiopia: a cross-sectional study. *BMC public health*, *19*, pp.1-8.
27. UNICEF. (2024). Girls' education. Available at: https://www.unicef.org/education/girls-education, [Accessed: 01/12/2024]

28. World Health Organization. (2024). Adolescent health. Available at: https://www.who.int/health-topics/adolescent-health/, [Accessed: 30/11/2024]
29. Africa Check. (2024). Do more than 37 million women and girls experience period poverty? Fact-checking two major claims about reproductive health in Nigeria. Available at: https://africacheck.org/fact-checks/reports/do-more-37-million-women-and-girls-experience-period-poverty, [Accessed: 30/11/2024]
30. Premium Times. (2024). SPECIAL REPORT: Rising cost of sanitary pads impedes menstrual hygiene among Nigerian women. Available at: https://www.premiumtimesng.com/gender/698340-special-report-rising-cost-of-sanitary-pads-impedes-menstrual-hygiene-among-nigerian-women.html, [Accessed: 01/12/2024]
31. PATH. (2015). Managing menstruation in low-resource settings: are cups the key? Available at: https://www.path.org/our-impact/articles/managing-menstruation-in-low-resource-settings-are-cups-the-key/, [Accessed: 01/12/2024]
32. Brookings. (2024). How cultural factors shape economic outcomes. Available at: https://www.brookings.edu/collection/how-cultural-factors-shape-economic-outcomes/, [Accessed: 01/12/2024]
33. Nnewi Community Portal, 2024. Living in Nnewi. Available at: https://nnewicommunity.com/living-in-nnewi/, [Accessed: 03/12/2024]
34. Sadiq, I.Z., Usman, A., Muhammad, A. *et al.* Sample size calculation in biomedical, clinical and biological sciences research. *J.Umm Al-Qura Univ. Appll. Sci.* (2024). https://doi.org/10.1007/s43994-024-00153-x
35. Fehintola FO, Fehintola AO, Aremu AO, Idowu A, Ogunlaja OA, Ogunlaja IP. Assessment of knowledge, attitude and practice about menstruation and menstrual hygiene among secondary high school girls in Ogbomosho, Oyo state, Nigeria. Int J Reprod Contracept Obstet Gynecol. 2017;6(5): 1726-32.
36. Senapathi P, Kumar H. A comparative study of menstrual hygiene management among rural and urban adolescent girls in Mangaluru, Karnataka. International Journal of Community Medicine and Public Health. 2018;5(6):2548-56.
37. Mohammed Gena H., 2020. Menstrual hygiene management practices and associated factors among secondary school girls in East Hararghe Zone, Eastern Ethiopia. Adv Public Health. 2020:1-7.
38. Ray, S. and Dasgupta, A., 2012. Determinants of menstrual hygiene among adolescent girls: a multivariate analysis. *National journal of community medicine*, *3*(02), pp.294-301.
39. Uzoechi, C. A., Parsa, A. D., Mahmud, I., Alasqah, I., & Kabir, R. (2023). Menstruation among In-School Adolescent Girls and Its Literacy and Practices in Nigeria: A Systematic Review. *Medicina, 59*(12), 2073.
40. Duru, C. O., Ikeanyi, E. M., & Merenu, I. (2021). Knowledge and practice of menstrual hygiene among adolescent school girls in Umunna, Imo State, Southeast Nigeria: implications for parents, healthcare providers and policy makers. *International Journal of Reproduction, Contraception, Obstetrics and Gynecology, 10*(2), 293.
41. Anbesu, E. W., & Asgedom, D. K. (2023). Menstrual hygiene practice and associated factors among adolescent girls in sub-Saharan Africa: a systematic review and meta-analysis. *BMC Public Health, 23*, 33.
42. PSI. (2018). Access to Pads: Five Takeaways from Menstrual Hygiene Management (MHM) Research with Adolescent Girls and Young Women in India and Ethiopia. Available at:

INTERNATIONAL JOURNAL OF MEDICAL SCIENCE AND PUBLIC HEALTH RESEARCH (ISSN – 2767-3774)
VOLUME 05 ISSUE 12 Pages: 15-36
OCLC –1242424495

https://www.psi.org/2018/10/access-to-pads-five-takeaways-from-menstrual-hygiene-management-mhm-research-with-adolescent-girls-and-young-women-in-india-and-ethiopia/, [Accessed: 01/12/2024]

43. Babbar, K., & Garikipati, S. (2023). What socio-demographic factors support disposable vs. sustainable menstrual choices? Evidence from India's National Family Health Survey-5. *PLOS ONE, 18*(8), e0290350.
44. Elledge, M. F., Muralidharan, A., Parker, A., Ravndal, K. T., Siddiqui, M., Toolaram, A. P., & Woodward, K. P. (2018). Menstrual Hygiene Management and Waste Disposal in Low and Middle Income Countries—A Review of the Literature. *International Journal of Environmental Research and Public Health, 15*(11), 2562.
45. Belayneh, Z., & Mekuriaw, B. (2019). Knowledge and menstrual hygiene practice among adolescent schoolgirls in southern Ethiopia: a cross-sectional study. *BMC Public Health, 19*, 1595.
46. Demmu, Y. M., Shifera, G. M., Ayana, G. M., Adare, D., Yazew, B., Damtew, Y. T., & Geremew, A. (2023). Menstrual hygiene management and associated factors among adolescent school girls in Gursum district, Eastern Ethiopia: Institution-based a cross-sectional study. *BMC Women's Health, 23*, 328.
47. Tegegne, T. K., & Sisay, M. M. (2014). Menstrual hygiene management and school absenteeism among female adolescent students in Northeast Ethiopia. *BMC Public Health, 14*, 1118.
48. Citron Hygiene. (2023). Menstrual Hygiene Management - Waste Disposal Techniques. Available at: https://www.citronhygiene.com/resources/menstrual-hygiene-management-waste-disposal-techniques/, [Accessed: 28/11/2024]
49. CDC. (2024). Healthy Habits: Menstrual Hygiene. Available at: https://www.cdc.gov/hygiene/about/menstrual-hygiene.html, [Accessed: 27/11/2024]
50. Mehta, N. (2024). 10 Hygiene Tips During Periods For Women. Available at: https://drnehamehta.com/hygiene-tips-during-periods-for-women/, [Accessed: 27/11/2024]
51. Gebre, W., Kidane, E. M., Negussie, Y. M., Getahun, M. S., Bekele, N. T., & Gurara, A. M. (2023). Assessment of menstrual hygiene management knowledge, practice, and associated factors among girls in Boset District, Ethiopia: a school-based cross-sectional study. *Contraception and Reproductive Medicine, 8*, 34.
52. Fennie, T., Moletsane, M., & Padmanabhanunni, A. (2022). Adolescent girls' perceptions and cultural beliefs about menstruation and menstrual practices: A scoping review. *African Journal of Reproductive Health, 26*(2), 88-105.
53. Herbert, A., 2018. *The Growing Girls Project: Experiences of Puberty and Menstruation in a Low-Income, Minority US Context* (Doctoral dissertation, Johns Hopkins University).
54. UNICEF. (2024). Period Poverty – why millions of girls and women cannot afford their periods. Available at: https://www. unwomen.org/en/news-stories/explainer/2024/05/period-poverty-why-millions-of-girls-and-women-cannot-afford-their-periods, [Accessed: 20/11/2024]
55. Sommer, M. and Mason, D.J., 2021, August. Period poverty and promoting menstrual equity. In *JAMA Health Forum* (Vol. 2, No. 8, pp. e213089-e213089). American Medical Association.
Chandra-Mouli, V., & Patel, S. V. (2017). Mapping the knowledge and understanding of menarche, menstrual hygiene and menstrual health among adolescent girls in low- and middle-income countries. *Reproductive Health, 14*, 30.
56. Moon, G., Kim, I., Kim, H., Choe, S., Jeon, S., Cho, J., & Hong, S. (2020). How can we improve knowledge

and perceptions of menstruation? A mixed-methods research study. *BMC Women's Health, 20*, 214.