UNIVERSITY OF GHANA

MENSTRUAL HYGIENE MANAGEMENT AMONG SENIOR HIGH SCHOOL STUDENTS IN THE NEW JUABEN NORTH MUNICIPALITY

BY

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DECLARATION

I hereby do declare that this work is the result of my own research and has not been presented by anyone for any academic award in this or any other University. All references used in the work have been duly acknowledged.

I do bear sole responsibility for my shortcomings.

6th June, 2023

MARY ADEBI NYAMEKYE (10577529) DATE

CERTIFICATION

I hereby certify that this thesis was supervised in accordance with procedures laid done by the University.

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DEDICATION

This thesis is dedicated to my parents Mr. and Mrs. Nyamekye for their immense support and all my friends and loved ones who supported me through this journey.

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LIST OF ABBREVIATIONS

AGYW	Adolescent Girls and Young Women
GBV	Gender Based Violence
GES	Ghana Education Service
GDHS	Ghana Demographic Health Survey
GHS	Ghana Health Service
GSS	Ghana Statistical Service
LARCs	Long Lasting Reversible Contraceptives
LMICs	Low- and Middle-Income Countries
MHM	Menstrual Hygiene Management
MHMP	Menstrual Hygiene Management Practices
NJNMA	New Juaben North Municipal Assembly
SDG	Sustainable Development Goal
SRH	Sexual and Reproductive Health
RMP	Reusable Menstrual Pads
UGS	Urogenital Infection Symptoms
USAID	United States Agency for International Development
VAT	Value Added Tax
WASH	Water, Sanitation and Hygiene

ABSTRACT

Menstruation, which is a physiological process, remains fundamental in the life of adolescents especially those in school with tendencies to impede their social lives, health and human rights including education. Despite menstruation being a natural and inevitable process, adolescent girls continue to face challenges with several misconceptions and myths. These influence the various menstrual hygiene management practices they adopt. Extant literature has looked at how several factors affect these management practices especially among rural dwellers and urban poor with little attention to peri-urban areas that are witnessing fast changes in economic and demographic characteristics. Thus, this study sought to assess the menstrual hygiene management practices among adolescent schoolgirls in peri-urban settings.

The study employed a cross-sectional research design using a quantitative approach of data collection to investigate the phenomenon in 2 senior high schools in the New Juaben North Municipality. A total of 557 respondents were randomly sampled for the study. Data was initially analyzed descriptively, and a logistic regression was performed. $P<0.05$ were considered statistically significant.

Overall, 61.22% of students had good knowledge, 21.36% exhibited moderate knowledge and 17.41% showed poor knowledge on menstrual hygiene management. About 57% adopted good menstrual hygiene practices while 43% engaged in poor practices. Controlling for other factors, students who stay with mothers only during vacation, availability of bins for disposal of pads and adequacy of WASH facilities for menstrual hygiene needs were significant predictors of good menstrual hygiene practices. Poor privacy and adequacy of sanitary facilities in schools and the high price of sanitary pads were challenges to ensuring good menstrual hygiene practices.

Considering the sensitive nature of menstruation, any small knowledge gap translates to a gap in optimal health and social acceptance which influences education. Stakeholders should provide training as part of the educational curriculum to improve knowledge and provide a conducive environment to foster good practices. Also, the government should develop policies to subsidize the price of sanitary pads to reduce burden, improve access and foster adequate practice.

CHAPTER ONE

INTRODUCTION TO STUDY

1.0 Chapter Introduction

This introductory chapter provides a brief background about the focus of the study, menstrual hygiene management, the problem statement, the research objectives, and research questions. It also presents the significance of the study to research, policy and practice, the scope of the study and finally, the chapter arrangement of the thesis.

1.1 Background of the Study

Menstruation is a physiological process that occurs in females when they reach their puberty stage (Tegegne & Sisay, 2014; Winkler & Roaf, 2014), which leads to significant changes in their cognitive, physical, emotional, and social lives (Salim & Begum, 2016; Sumpter & Torondel, 2013). Menstruation remains fundamental in the life of women since it has the tendency to either facilitate or impede a whole range of human rights. According to Winkler (2020), menstruation unites the personal and the political, the intimate and the public and the socio-cultural and physiological aspects of an individual.

Consequently, there is a need to manage menstrual process also known as menstrual hygiene. The effective management of menstrual hygiene is essential for the welfare of the woman. Menstrual Hygiene Management (MHM) is defined as the "use of clean menstrual management material to absorb or collect blood that can be changed in privacy as often as necessary for the duration of the menstruation period, using soap and water for washing the body as required and having access to facilities to dispose of used menstrual management materials" (Sommer & Sahin, 2013 p.1557).

Even though menstruation is a natural and inevitable process that occurs in females, some societies and cultures consider it as a taboo (Bay, 2017; Salim & Begum, 2016) and hence, must not be a topic of discussion either publicly or in secrecy. The clouded notion of individuals, unhygienic methods and inappropriate space and environment for managing this natural predicament has led to various adverse social and health outcomes. Globally, females of reproductive age are almost half of the entire female population. Thus, it has created the room for MHM to be seen as a major public health issue in addition to its linkage to human rights, education, and health (Sommer, 2015).

MHM has received much attention on the public health agenda to decrease gender inequality in education and to keep girls of school going age at school (Boosey & Wilson, 2012). However, major gaps continue to exist in the implementation of this agenda (Sommer et al., 2021). Research shows that adolescents in most low-and middle-income countries (LMICs) engage in poor menstrual hygiene management practices (Sommer, Chandraratna, Cavil, Mahon & Phillips-Howard, 2016) and this is linked to inadequate knowledge on MHM, cultural practices, lack of water, sanitation, and hygiene (WASH) facilities among others which prevents them from achieving their MHM needs (Budhathoki et al., 2018; Thakuri, Thapa, Singh, Khanal & Khatri, 2021; Nitar, 2017).

Poor MHM usually leads to infections, loss of active hours and environmental pollution due to bad sanitary disposal approaches (Torondel et al., 2018; Kaur, Kaur & Kaur, 2018). The absence of WASH facilities prevents girls from attaining their MHM needs (Shah et al., 2013; Vijaysree, Kusneniwar, Vaz & Rao, 2016). The importance of adequate MHM cannot be underestimated due to its positive impact on the physical, mental health, education, and self-esteem of adolescent girls

(Janoowalla et al., 2020) as this leads to school absenteeism among girls of school going age (Miiro et al., 2018; Kuhlmann, Teni, Key & Billingsley, 2021; Davis et al., 2018).

About 200 million females of reproductive age are continuously faced with the daily struggle to get access to water, hygienic sanitary materials and convenient place for changing themselves during their menstrual period (Crofts & Fisher, 2012). A study conducted in Ghana revealed that the non-availability of toilet facilities, water, and poverty, negatively affects females of school going age during their menstrual period (Montgomery, Ryus, Dolan, Dopson & Scott, 2012) and this usually increases the occurrence of absenteeism and to the extreme, school dropout.

In Ghana, the population of the youth, according to the 2021 Demographic and Health Survey is 11,782,614, indicating 38.2% of the total population in the country (GDHS, 2021). This group forms a significant part of the country's population and are mostly found at different levels of the educational system. MHM forms an integral part of the educational system, especially for female adolescents who have begun menstruating. Although these females are exposed to information on MHM, many especially those in the rural and peri-urban areas still face challenges with managing menstruation effectively. In response to the growing challenges of MHM, several interventions have been implemented with a significant focus on the rural areas of Ghana. Key among these interventions is the development of a five-year strategic plan to promote effective MHM in schools and the provision of adequate WASH facilities in some schools (Annoh, 2021). Despite these attempts, MHM continues to be a personal hygienic, social, and public health problem for several female students across Ghana. In a study by Kumbeni, Otupiri and Ziba (2020) on MHM in Ghana, the authors noted that 38.6% of their respondents practiced bad MHM and this was evident in the fact that 91.2% of those who practiced bad MHM had issues related to personal hygiene and WASH facilities.

Adolescent females require uninterrupted access to WASH facilities, adequate information on recommended practices, suitable and low-priced menstrual hygiene materials, and a supportive environment to adequately manage menstruation without fear, embarrassment or stigma in school and the home environment. This study, therefore, seeks to assess menstrual hygiene management among female senior high school students in the New Juaben North Municipal Assembly.

1.2 Problem Statement

Globally, it is evident that a lot of girls and women in their reproductive age face quite a number of hinderances in their attempt to manage their menstruation (Chinyama et al., 2019; Boosey, Prestwich & Deave, 2014; Asiamah, Diabene & Wellington, 2017). Failure to address the menstrual hygiene needs of this vulnerable group can have detrimental effects on the attainment and progress of the Sustainable Development Goals (SDGs), as well as affect basic sanitation, education, hygiene, and reproductive health of the individuals (Tiwary, 2018; Budhathoki, 2018; Alam et al., 2017). It is estimated that over 26% of the global population experience menstruation and 800 million people menstruate each day (Sommer et al., 2016). Despite this, 500 million of them lack good hygiene management and access to menstrual hygiene products (Regional Health-Americas, 2022).

In some areas, the poor MHM practices are largely linked to the inadequacy of knowledge and myths (Mohammed & Larsen-Reindorf, 2020). A study conducted in India revealed that 70% of mothers regarded menstruation as dirty and this is linked to the presence of deep-rooted culture of ignorance, stigmatization, shame, and geographical exposure (USAID, Kiawah, Trust & Dasra, 2014). This study again showed that about 88% of Indian women practiced poor MHM since they use wood shavings, straw or rags as their absorbent, and this has led to a 70% increase in cases of reproductive tract infections (RTIs).

Other studies have shown that unhealthy practices of MHM among adolescent girls are highly prevalent in LMICs (Salim & Begum, 2016; Mondal, Ali, Dewan & Tasnim, 2017). Globally, poor MHM affects girls' school attendance and academic progress both physically and psychologically (Boosey, Prestwich & Deave, 2014; Kuhlmann, Teni, Key & Billingsley, 2021). Hence, understanding the menstrual hygiene management practices (MHMPs) of students is, therefore crucial for informing strategies to promote and attain gender equality, health for all, equitable education, women's empowerment, and a sustainable environment in sync with the SDGs (Alam et al., 2017). Despite MHM being a significant public health issue globally, there is limited understanding of the extent of proper MHM in LMICs, including Ghana.

According to Kuhlmann et al. (2021), MHM among students remains a neglected public health issue even in developed countries like the US. Though the US has put in efforts to make MHM a priority in all its states, only 7 states have officially pushed the agenda and mandated schools to make MHM products freely available (Kuhlmann et al., 2021). Evidently, recent studies have revealed that menstrual products are freely available in schools in New Zealand (Triesman, 2021), and Scotland has gone the extra mile to make these products free and available to all who need them (Diamond, 2020). Whereas measures are being put in place in these developed countries to promote good MHM, the case is not the same for LMICs such as Ghana.

Studies on menstrual management practices conducted in Ghana have, however, focused on narrow topics such as the prevalence, experiences and factors of the practices or the relationship between menstruation and girls' school attendance (Rheinlander, Gyapong, Akpakli & Konradsen, 2018; Kumbeni et al., 2020; Mohammed, Larsen-Reindorf & Awal, 2020) with no consideration of the broader dimensions of MHM (Shah et al., 2019; Ramaiya et al., 2019; Wilbur et al., 2021). Others have explored the attitudes, practices, myths, and misconceptions about MHM (Mohammed & Larsen-Reindorf, 2020; Boakye-Yiadom et al., 2018), whereas some have looked extensively into WASH facilities and challenges (Asiamah, Diabene & Wellington, 2017; Acheampong, Nadutey, Afful & Anokye, 2017).

Despite the apparent depth of literature on MHM among female students in Ghana, quite a number of studies have posited that female students continue to experience challenges during their period and these challenges ranges from but not limited to distress, cost of sanitary products, embarrassment, misconception, managing issues of menstruation with deficient information, scarcity of water and hygienic facilities, absence of social support and absence of waste disposal amenities in school environment (Asumah, Abubakari & Aninanya, 2022).

Large numbers of the studies have concentrated on schools in typical rural and urban areas (Aggarwal, Ambalkar, Madhumathi, Badge & Humne, 2021; Schmitt et al., 2017) with total neglect of areas that are usually classified as peri urban. The growing population, increasing trade and education and changing demographic characteristics in these areas make students as vulnerable as rural folks and the urban poor. However, very little has been done regarding these female students who find themselves between the dynamics of rural and urban mix. Thus, it is essential for studies to examine the MHM among female senior high school students in peri-urban areas of Ghana.

1.3 Research Objectives

The objectives of this study are:

1. To assess the knowledge of adolescent girls on menstrual hygiene practices in a peri-urban community;

2. To assess the menstrual hygiene management practices predominantly adopted in a peri-urban community;

3. To examine the factors that influence menstrual hygiene practices among adolescent girls in a peri-urban community; and

4. To examine the barriers to good menstrual hygiene management practices among adolescent girls in a peri-urban community.

1.4 Research Questions

Consequently, the questions that the study intend to answer are:

1. How knowledgeable are adolescent girls on menstrual hygiene practices?

2. What are the predominant menstrual hygiene management practices adopted among adolescent girls?

3. How do demographic and knowledge factors influence menstrual hygiene management practices among adolescent girls?

4. What are the barriers to good menstrual hygiene management among adolescent girls?

1.5 Research Hypothesis

To achieve the objectives of the study and answer the research questions posed above, the study hypothesizes that:

H_0: There is no relationship between the demographic, knowledge factors and menstrual hygiene practices. ie. ($ß_1 = ß_2 = \ldots\ldots\ldots ß_k = 0$)

H_a: There is a relationship between the demographic, knowledge factors and menstrual hygiene practices. ie. ($ß_1 = ß_2 = \ldots\ldots\ldots\ldots ß_k \neq 0$)

1.6 Significance of the Study

The negative impact of poor MHM on the female child education, health and societal development cannot be overemphasized. Similarly, engaging in good hygiene practice create the chance for female adolescents to remain in school, remain healthy and fit in society. Thus, it is very important for much attention to be paid to such issues. The outcomes of menstrual hygiene practices largely emanate from the knowledge one has, practices adopted and the society in which the individual lives. It is essential for studies to generate evidence on the knowledge, practices and factors that influence practices. Results from the study will enable public health professionals know the impact of their educational intervention strategies and the gaps that needs to be covered. Also, it will provide knowledge on what policy measures are needed to ensure good MHM. Finally, areas of further research will be elaborated in this study to ensure holistic MHM among female adolescents.

1.7 Scope of the Study

The study covers MHM among students in peri-urban areas in Ghana. The study examined the knowledge, practices, factors of influence and finally the barriers impeding good MHM.

1.8 Chapter Arrangement

The study is presented in five distinct chapters. The first chapter, which also serves as the introductory chapter, presented a brief background on MHM, the problem statement, research objectives and questions, research hypothesis, significance of the study and scope of the study. Chapter two reviewed the literature relevant to the study and presented the conceptual framework. The third chapter covers the methods used to collect data to address the research questions. Chapter four presents the findings of the study, analysis and the discussion of the study findings in line with existing literature. The final chapter, which is chapter five, presents a summary of the study findings, conclusions, recommendations, and implications of the study findings to policy and practice.

1.9 Chapter Conclusion

This chapter presented a brief background on the topic of study which is, menstrual hygiene management among students in secondary schools. It also covered the problem statement, research objectives, questions and hypothesis, significance and scope of the study. It then presented an overview of the arrangement of all the chapters in the study.

CHAPTER TWO

LITERATURE REVIEW

2.0 Chapter Introduction

This second chapter provides an in-depth summary of the substantial empirical research on the topic. This chapter discusses fundamental ideas, a theoretical framework, and empirical studies on MHM. This chapter presents literature on the overview of menstruation, overview of MHM, knowledge on MHM, MHM practices, factors that influence MHM, barriers to good MHM practices and the conceptual framework.

2.1 Overview of Menstruation

Menstruation is a natural part of the reproductive process that a woman's body goes through to prepare for pregnancy. Menstruation, which occurs naturally in women, is characterized by a bloody discharge from the uterus due to the uterine wall degenerating in the absence of sperm cell for fertilization (Hastuti, Dewi & Pramana, 2019). Thus, it occurs when the lining of the uterus of a female in her reproductive years sheds blood when she does not conceive. Menarche, the term for this first shedding, is identified by the flow of blood through the uterine canal (Taimuri & Sumbal, 2022). Menstruation lasts between 2 to 7 days every 28 to 35 days (Hastuti et al., 2019). Puberty, menstruation and physical development are closely related processes (Hastuti et al., 2019). A study by Kuhlmann, Henry and Wall, (2017) revealed that menarche is a process experienced by many women since it marks the reproduction transition of females into full adulthood.

According to Batubara, Soesanti and van de Waal (2010) and Hastuti et al. (2019), puberty begins when significant physical changes occur to transition a child to an adult. These changes may include, but not limited to, the enlargement of the chest, breaking of the voice, breast blooming, which is followed by an increase in height, hair growth in the pubic area and other parts of the body, and the beginning of menstruation, also known as menarche. Another aspect of puberty that affects the skin is the early pimples, which frequently appear during adolescence and can persist into adulthood (Hastuti et al., 2019; Kandauda, Bandara, Tennakoon & Gunathilake, 2020).

A study conducted among 42,879 women in the Netherlands revealed that menstruation had significant negative impact on work and school attendance, as well as productivity and this natural occurrence is still guarded in cultural taboos (Schoep et al., 2019a). A similar study among 32,748 women corroborated these findings since it also indicated that menstruation is linked to low productivity (Schoep et al., 2019b). A study in the United States revealed that menstruation is linked to insufficient and poor pain management, shame and lack of adequate information (Schmitt et al., 2021). Studies in LMICs corroborated these findings since most females in resource-poor countries are forced to miss school due to challenges of managing their period. A study conducted in Ethiopia on the age of menarche and MHM among 492 adolescent schoolgirls revealed that 51.2% absented themselves from school during their period (Gultie, Hailu & Workineh, 2014) though they had access to WASH facilities. Another study done in Uganda found out that most females missed school during their menstrual cycle due to the absence of private changing spaces, fear of staining themselves, pain, discomfort and even the lack of absorbents (Boosey, Prestwich & Deave, 2014).

2.2 Overview of Menstrual Hygiene Management

According to Sommer and Sahin (2013 p.1557) MHM is when "women and adolescent girls using a clean menstrual management material to absorb or collect blood that can be changed in privacy as often as necessary for the duration of the menstruation period, using soap and water for washing the body as required and having access to facilities to dispose of used menstrual management materials". Hence, it can be defined as the management of hygiene associated with the menstrual process or the method by which females and adolescent girls utilize hygienic menstrual management products to absorb or collect menstrual blood (Deriba et al., 2022).

The definitions of MHM above illustrate the need for environmental support to develop healthy MHM habits and maintain ideal body hygiene during menstruation. A safe and readily available place to change, access to sanitary disposal facilities, and availability of soap and water for personal hygiene are all necessary components of MHM (Hastuti et al., 2019). According to Trant et al. (2022), MHM revolves around the availability of essential menstrual products for holding menstrual blood flow, cleaning, washing and acceptable private facilities to perform hygiene tasks.

MHM is noted to be a very essential part of a woman's wellbeing and health (Budhathoki et al., 2018). A study conducted in Nepal on MHM among 127 women and adolescent girls, in the aftermath of an earthquake, revealed that, menstrual hygiene was rated one of the highest and immediate needs even during disasters (Budhathoki et al., 2018), and usually was not given much attention during such situations.

Another study revealed that MHM has been linked largely to absenteeism, urogenital infections and psychosocial effects (Trant et al., 2022). The study further noted that psychological support, information availability, and understanding of the menstrual cycle are also necessary for women to manage their periods with confidence and without fear or discomfort. To help females feel more confident throughout menstruation, it is important for them to know how to deal with menstrual blood loss, have more knowledge about it, improve their personal hygiene practices and try to overcome or manage the challenges they experience during their menstrual cycle.

2.3 Knowledge on MHM

Studies have posited that most adolescents reported that they were unprepared and had little knowledge on menstruation prior to the onset of menarche and this was evident among adolescents in both developed and developing countries (Trant et al., 2022; Sommer, Schmitt, Gruer, Herbert & Phillips-Howard, 2019) and this might be as a result of the stigma associated with the phenomenon and the fact that in recent times, menstruation starts relatively earlier than it used to. Early education on menarche from a well-informed adult is noted to be essential for adolescents since it shapes their experiences during menarche, their views on menstruation, and their self-image for years afterwards (Mohammed & Larsen-Reindolf, 2020). Trant et al., (2022) in their study revealed that 86% of their respondents indicated that they discussed menstruation with their mothers, 48% in school, and 45% with health professionals and these discussions and education usually occur after they had experienced their menarche.

Parent et al. (2022) examined French women's hygiene habits and found that, patients are becoming more knowledgeable about the items they are using, their potential health hazards, and their environmental effects, even if conventional sanitary protection remained the most popular. In order to make an informed decision about the product they believed was best for them and in which they had confidence, patients sought information on the topic from both manufacturers and healthcare professionals. Meanwhile, a recent study by Asumah et al. (2022) which identified the MHM habits of teenage girls in Junior High Schools in the West Gonja Municipality of the Savannah Region of Ghana indicated that two-thirds of schoolgirls are taught proper menstrual hygiene, but the accessibility of menstrual supplies raises questions about the essence of the knowledge they gained since these girls are forced to use fabric and cotton because only about half of them have access to sanitary pads.

A study done in Ethiopia revealed that most females have high knowledge (90.7%) about menstrual hygiene (Gultie et al., 2014). However, a study in Ghana revealed that, knowledge on menstrual hygiene was relatively low, since only 44.4% of the females had good knowledge on menstruation (Mohammed & Larsen-Reindorf, 2020). This finding was not so far from another study on the relationship between female university students' knowledge on menstruation and their menstrual hygiene practices since their overall mean knowledge score was 57.3% (Ameade & Garti, 2016). A study in Ethiopia revealed that about 88% of the respondents indicated that they did not have knowledge about menstruation before menarche and this led them to be unprepared when they experienced their menarche (Parvin, Parvin, Haque & Islam, 2016).

Menstrual health education must be given high priority since stigmas associated with menstruation may make it difficult for some people to obtain help. According to a study by Montgomery, Ryus, Dolan, Dopson and Scott (2012), the Ghanaian government's plan to provide schoolgirls with sanitary pads might significantly improve MHM if implemented in all schools, particularly in remote areas. However, in the Sitapur region of India, Gupta, Mishra, Parihar and Kumari, (2021) evaluated the knowledge and practices of menstruation hygiene among women aged 13 to 45 and it was evident that, there existed concerns about menstrual hygiene awareness also in India. According to the findings of this hospital-based cross-sectional study, the participants' average age was 29 years; 76.8% of them were unaware of menstruation before menarche; about 23.78% were unaware of the reason for menstruation, and 75.20% of them lived in rural areas and obtained their menstrual information from there (Gupta et al., 2021).

Holst et al. (2022) examined the perceptions of women and menstruating individuals between the ages of 18 and 55 in Barcelona and the surrounding areas of Spain regarding menstrual health and unfairness. The findings revealed that, participants appeared to share a common experience of menstrual inequality and these inequalities emanated from the negative effects of having to conceal one's menstruation and the challenges of doing so in public. Also, the study posited that the major selection criteria for period products included cost and availability, and several women brought up the issue of menstrual poverty. Holst et al. (2022) further elaborated on the fact that individuals are profoundly impacted by menstruation and menstrual cycles in their daily lives and the best form of menstrual education is learnt from personal experiences.

A study by Munro, Keep, Hunter and Hossain (2022) to understand the factors impacting university students' confidence during their periods at an Australian university revealed that only 16.2% of students said they were confident in their capacity to control their periods at school. Knowledge of menstruation, positive attitudes toward menstruation, and ease of discussing menstruation with others were all positively correlated with confidence. Also, physical monthly symptoms, unfavorable attitudes regarding menstruation, perceived stigma, and wearing period underwear or a menstrual cup were all indicators of lower confidence. A multiple regression on perceived stigma, negative attitudes toward menstruation, private, hygienic, and sanitary university toilets, and switching period products in university all remained significant predictors of menstrual confidence (Munro et al., 2022).

Munro et al. (2022) again indicated that most students did not have complete confidence in their capacity to manage their periods while at school and numerous individualized, physiological, and environmental variables were linked to students' confidence in their capacity to control their periods. Hence, it is evident that, knowledge on menstruation is strongly associated with MHM since lack of information and knowledge has implications on menstrual hygiene practice.

2.4 MHM Practices

Studies by Mohammed et al. (2020) and Upashe, Tekelab and Makonnen (2015) indicated that, older adolescents are more likely to practice good MHM as compared to younger ones and this might be attributed to the fact that older adolescents have gained more experience and knowledge in managing their menstruation since older adolescents are more likely to choose the right menstrual absorbent, change their absorbent frequently and bath frequently. The study by Mohammed et al. (2020) further revealed that, 45.2% of the respondents changed their menstrual absorbents frequently, or three or more times daily. A study in Senegal indicated that more than half of the respondents, which accounts for 54.7% of the total respondents changed their menstrual hygiene products at least three times daily (Women, 2014).

A study conducted in Myanmar revealed that, though about 90% of respondents took their baths during their periods, it was surprising to know that they did not uphold other hygienic practices like washing their hands before and after they handled or changed their menstrual products (Nitar, 2017). This finding might be due to the limited knowledge of adolescents since most of them are not informed prior to the onset of menarche. Another study in southern Ethiopia revealed that 60.3% of adolescent girls practiced poor menstrual hygiene (Belayneh & Mekuriaw, 2019). This finding can be linked to quite a number of factors like socio-economic and environmental constraints, limited knowledge and information, culture and tradition (Lahme, Stern & Cooper, 2018) and other barriers they are susceptible to.

The disposal of menstrual product is another component of MHM issues. Appropriate disposal systems for used menstrual products is still deficient in quite a number of low- and middle-income countries. A study in Zambia revealed that girls usually put their used disposable pads in the latrines due to fear, coupled by spiritual and cultural beliefs (Chinyama et al., 2019). This finding is not far from that reached by Mohammed et al., (2020) on disposal, and about half of the respondents (49.5%) revealed that they missed school during their menstrual period because of the absence of disposal facilities for used pads and cloth. In many instances, the lack of a designated bin for menstrual waste makes women or adolescent girls either dispose their menstrual waste as part of their household waste, burn it, bury it, throw it into pits or even flush them down the drain (Kaur, Kaur & Kaur, 2018) depending on the circumstances they find themselves.

The disposal behavior of adolescent girls and women varies depending on where they find themselves. Thus, an individual may use one type of disposal method at home but might resort to another when not at home since they may not have access to the same disposal options when they are far from home. A study in Uganda indicated that though in some schools there exist feminine hygiene bins or incinerators for menstrual waste, due to stigmatization, fear of being seen by others and shyness, most girls refrain from using them (Crofts & Fisher, 2012).

Similarly, Parthasarathy, Jayaraman, Jeganathan and Lakshminaravanany (2022) conducted a survey among 445 respondents in India to learn more about women's menstrual practices. The findings indicated that few people used sanitary pads, and there were inefficient disposal methods since only incinerators were used to dispose of sanitary waste. The study's findings showed that 40.4% of the respondents had no idea what an incinerator was. Only 17.8% of the respondents used the device, even though 59.6% of them were aware of it. An efficient, inexpensive, and simple-to-use smart incinerator would be a better solution to the problem of disposing of soiled pads.

Gupta et al. (2021) revealed in their study that, while majority of participants (79.39%) wore used clothing, only 4.72% of women in rural areas solely used sanitary pads, compared to 75% of women in urban areas. 52.36% of people in rural areas used only water as their sole means of genital hygiene maintenance. Pandit, Hasan, Islam and Rakib (2022) also evaluated and documented MHM among teenage Rohingya girls in Bangladesh, along with any potential ongoing issues. They found that 28.71% of adolescent females were aware of premenstrual symptoms. Only 8% and 12%, respectively, had "Good" knowledge and basic comprehension. The authors further indicated that most of the women wore garments during their periods, with the remaining percentages using sanitary pads (20.79%), non-absorbent underwear (17.82%), and homemade clean pads (10.89%).

The study again revealed that, most respondents barely changed their sanitary pads since majority (48.51%) indicated they changed their pads only once daily, and their disposal methods or locations included trash cans (6.93%), open spaces (17.82%), bathrooms (30.69%), and water sources (3.96%). The findings from Pandit et al. (2022) further indicated that irregular and insufficient supply of absorbents or sanitary towels contributes to poor MHM practices and the factors that influenced pad usage and disposal were the absence of privacy in camps or informal settlements, crowded quarters, lack of support within the camp, and poor cleaning and disposal facilities. According to the study by Pandit et al. (2022), providing adolescent-friendly WASH facilities, appropriate information, and enough menstrual supplies are necessary to improve the MHM response in an emergency and also reduce experiences of stigma, restrictions, and worries about sexual violence while engaging in regular daily activities.

Deng et al. (2022) in their studies concluded that bathing or vaginal cleansing with water only had a significant correlation with urogenital infection symptoms as compared to washing with soap and water during menstruation. Reusable pad storage and drying in bathrooms were found to be associated with a higher incidence of candida infections. The risk of genital infections was also enhanced by taking a bath while sitting during menstruation, not drying the genital region or using a cloth to do so and skipping hand washing. The risk of recurrent vaginal infections may also rise when postpartum native folk remedies are used, and secondary infertility has been associated with using the incorrect ingredient to absorb menstrual blood.

Torondel et al. (2022) also assessed the impact of a collective household-level piped water and sanitation intervention on MHM practices and urogenital infection symptoms (UGS) among women living in rural Odisha in India. According to the authors, MHM practices were deemed adequate if they met some of the benchmarks developed based on international standards that the Gram Vikas (GV) program raised (washing the body with soap, adequate frequency of absorbent change, and privacy for managing menstruation). The GV program was an initiative by a local non-governmental organization to address water and privacy issues in households and at community levels in India. Multilevel mixed-effects logistic regression with a random effect distribution at the community and village levels was used to determine the impact of the intervention on sufficient MHM practices (the primary outcome) and reported UGS (secondary outcome) (Torondel et al., 2022).

The study included 1045 women (517 from the intervention group and 528 from the control group). In the intervention villages compared to the control villages, women were more likely to report engaging in sufficient MHM practices. 14.51% and 15.53% of the women in the control and intervention villages, respectively, reported having at least one UGS. There was no evidence that such interventions had any effect on the reported UGS. Even if they enhance the context that enables MHM activities associated with privacy conceivable, the presence of such facilities alone had no impact on appropriate MHM and no impact on self-reported UGS. The study suggested that more focused innovations that address other obstacles and behavior modification strategies may be needed to improve MHM practices.

However, Robinson and Barrington's (2021) systematic review of menstrual health and hygiene identified and summarized the key behavioral drivers pertaining to the decision of disposal and washing practices of menstrual materials. The study evaluated 82 publications which reported the findings of primary research on menstrual health and hygiene. The authors discovered that menstrual waste disposal and washing habits are primarily impacted by the condition of sanitary facilities and are intricately linked to menstruation-related taboos and knowledge.

Additionally, Van Eijk et al. (2021) used quantitative and qualitative studies to assess the acceptability, safety, and leakage of reusable menstrual pads (RMPs) in LMICs and refugee settings. According to the authors, washing and changing RMP is challenging due to absence of water, soap, privacy, buckets, and drying facilities/sanitary facilities but RMPs are a safe, efficient, cost-efficient, and an ecologically responsible option as compared to tampons and single-use pads.

Blair, Baion-Fernandez and Villa (2022) examined menstrual waste, products, and methods already in use in the UK. The study found that out of the estimated 28,114 tonnes of waste produced annually, disposable menstrual items accounted for 26,903 tonnes, of which 4% (3,363 tonnes) are lost to the environment through flushing. The authors opined that disposable pads were the least sustainable menstrual product among the other menstrual products that were considered in the study since disposable pads accounted for majority of menstrual waste volumes. The authors concluded that a transition from disposable to reusable menstrual management products (MMPs) will reduce waste output and reduce the emission of greenhouse gases.

Finally, Kaur et al. (2018) concluded that the negative factors that influence practicing good menstrual hygiene include but not limited to lack of privacy, poor disposal methods, unavailability of WASH facilities, ignorance and misconceptions.

2.5 Factors that influence MHM

Mohammed et al. (2020) in their study revealed that, the age of adolescent girls as well as their father's occupation and receipt for allowance for menstrual hygiene products have significant association with their MHM. A community-based, quantitative cross-sectional study done among 410 adolescent girls in Myanmar to ascertain the factors that influence MHM revealed that girls who have good knowledge on menstruation were two times more likely to practice good menstrual hygiene compared with those with poor knowledge (Htun, Laosee, Rattanapan, 2020). The study further indicated that, positive attitude towards menstruation was associated to good MHM and girls with poor MHM practices were 1.1 times more likely to have negative effects on their daily routines as compared to those who practice good MHM. They further opined that accessibility to MHM facilities were necessary for managing menstrual hygiene well (Htun et al., 2020).

Another study by Bulto (2021) indicated that based on a bivariate analysis, parents educational background, place of residence, age of the participant, exposure to pre menarche information, information sources, presence of lockable toilets among others were significantly associated to safe menstrual hygiene management practice. Pocket money and residential status were the two main indicators of how well women managed their menstrual hygiene, according to Asumah et al., (2022). With respect to another study done by Afriyani and Salafas (2020) on factors influencing menstrual hygiene practices among adolescent girls, the authors found out that good knowledge of menstrual hygiene is four times likely to translate to good menstrual practices.

Rocha et al. (2022) evaluated the menstrual poverty of 177 migratory adult Venezuelan women of childbearing age at the northern border between Venezuela and Brazil. In terms of menstruation poverty, findings of the study revealed that 36.16% of the respondents said the supplies of period hygiene items provided by humanitarian organizations were insufficient, and 24.86% said they were unable to wash their hands whenever they wanted to. The authors concluded that inadequate access to sanitary goods and services, lack of knowledge about how to access SRH services, the risk of unintended pregnancy, and lack of long-lasting reversible contraceptives (LARCs) make female very vulnerable.

In order to identify the districts where the use of sanitary absorbents by rural adolescent women during menstruation was clustered, Singh, Charkrabarty, Chowdhury and Singh (2022) in India examined the spatial patterns of the utilization. In addition, the study examined the factors that contribute to the spatial imbalance in the use of sanitary absorbents alone. With a Global Moran's I value of 0.51 and spatial autocorrelation in favor of the exclusive use of hygienic absorbents, geospatial analysis of the outcome variable revealed this. While statistically significant hotspots were found in districts in South India, statistically significant cold regions were found in districts in Central India. The study indicated that women's education, social group, religion, home wealth, work status, and exposure to mass media all had a significant impact on the exclusive use of sanitary absorbents in Indian areas.

In Zambia, Hensen et al. (2022) used a mixed-methods analysis from a program offering comprehensive sexual and reproductive health (SRH) services to describe access to MHP and how COVID-19-related closures affected access to MHP. To comprehend adolescent girls' and young women's (AGYW) experiences using the items, they also used qualitative data. According to the data, 34,116 hubs were visited by 6,374 AGYW to use an SRH service or earn rewards between September 2019 and January 2021. In 30% of these trips, AGYW used a menstrual hygiene product. 34% of monthly journeys for freely available disposable pads were made before COVID-19 closures, compared to 17% before hubs reopened. The outcomes for reward visits were similar. A total of 6374 AGYW, or 63% of them, collected pads as a service at least once.

Before COVID-19 closures, AGYW between the ages of 18 and 24 used service pads more frequently than teenagers (15–17 years). The reopening limited access for older AGYW. Before hub closures, reward MHP use was higher among AGYW with some secondary education but decreased after the hubs reopened. Discussions revealed that the alternative open to teenagers between the ages of 15 and 19 during hub closures linked to COVID-19 was the use of substandard materials to manage menstruation.

2.6 Barriers to Good MHM Practices

Despite the array of interventions and actions taken to make the culture and shame shrouded on menstruation a thing of the past, there still exist a myriad of barriers to be addressed. Consequently, women are faced with challenges due to poor awareness and knowledge embedded with cultural practices and beliefs of the society on menstruation. A study conducted in India on the concerns of MHM revealed that despite the Indian government's efforts in putting measures in place to foster menstrual education, prevailing sociocultural norms and notions still makes menstruation a topic of privacy to an extent that, not only girls and women experiencing their menarche or menstruation feel shy about it, but also key informants like health care professionals, mothers and even teachers also feel uncomfortable to discuss issues related to menstrual hygiene management (Sinha & Paul, 2018).

MHM remains an insignificant component in crisis since it is considered as a low-priority issue and not an arduous life-threatening issue though women and girls struggle to manage their periods with pride and dignity (Sinha & Paul, 2018). Globally, a number of studies conducted in both developed and developing countries have posited the fact that, disposable pads remain the most widely used and acceptable menstrual hygiene product as compare to the reusable pads, menstrual cups and disc, tampons, cloth, cotton among others (Choi, Lim, Jung, Kim & Park, 2021;

Mohammed, Larsen-Reindorf & Awal, 2020; Htun et al., 2020). In spite of this, accessibility to these menstrual products remains a challenge (Mprah, Sackey& Dourinaah, 2022).

Disposable menstrual pads remain an indispensable asset for women and girls in their reproductive ages. Approximately, a female uses about 11,400 pads throughout her reproductive years (Choi et al., 2021). Contrarily, a study conducted in the northeastern part of Ethiopia on MHM and school absenteeism among female adolescent students concluded that, most adolescent girls used rags, clothes and other old cotton fabric as their menstrual absorbent material (Tegegne & Sisay, 2014). These findings were not far from that reached by another study done in Mali on the challenges associated with menstrual hygiene in schools (Trinies, Caruso, Sogore, Toubkiss & Freeman, 2015). The differences in conclusion might be due to the geographic context, difference in years the studies were conducted and other socio demographic characteristics.

Choi et al., (2021) conducted a cross-sectional study on the use of menstrual sanitary products in women of reproductive age among 20,613 Korean nurses. Among their sample only 8,658 respondents participated in a module which included a menstrual hygiene product-related survey. The findings of this study revealed that the main reason why most adolescent girls and women choose disposable pads as their menstrual hygiene product was because of comfort. Further, the same study revealed that 84.8% of the respondents liked disposable menstrual pads because it was convenient to change and easy to dispose (50.8%). Though this study did not consider the price of menstrual products as a huge determinant to the choice of the product, the price of commercial sanitary products has become a nightmare for most adolescent girls and women of reproductive ages.

In both low- and middle-income economies, the cost of menstrual hygiene products serve as a barrier to practicing good menstrual hygiene. A 2022 report by Kent Mensah of the Thomson

Reuters Foundation indicated that, the global problem of spiraling inflation has led to a triple hike in the cost of pads within the African continent and led to a number of girls of school going age to stay out of school or resort to unhygienic alternatives to solve their menstrual crisis. The report also revealed that, in Ghana many adolescent girls have been lured into having transactional sexual relations in exchange for sanitary products. Similarly, a report by Linda Carroll in 2019 revealed that two-thirds of women with low income in developed countries like the US could not afford menstrual products. Hence, the challenge of pricing is a pain in the life of most adolescent girls and women, to the extent that, the burden trickles down to their support systems if they are dependents.

Studies by Kuhlmann et al., (2017) revealed that, in other to minimize occurrences such as these that lead to transactional relationship and women giving up their dignity to afford sanitary products. Countries like Kenya and India over the past few years have put in efforts and removed the value-added tax (VAT) on menstrual hygiene products and subsidized commercial sanitary products for adolescent girls living in rural areas respectively.

The sort of WASH-related violence against women that take place in LMICs were described in Nunbogu and Elliott's scoping review from 2022. After examining 29 peer-reviewed publications, the study identified four components of WASH-GBV: structural, physical, psychological, and sexual. They discovered that gender norms mimic power dynamics that interact with social exclusion, injustice, and marginalization factors to shape violent behaviors. They developed a conceptual framework that demonstrates how contextual factors encourage and contribute to gender-based violence related to WASH based on these discoveries.

According to the survey, no school met the standards for WASH in schools. In around a third of the schools, there was no reliable way to use water inside the bathroom complex. Schoolgirls reported feeling stressed and ashamed when having their periods at school, and many said they would attempt to avoid using the toilets if possible. Schoolgirls stated that guaranteeing facility cleanliness and fostering privacy was less important than the need for access to water. Key informants also emphasized the need to develop maintenance methods and spread awareness of menstruation and general cleanliness. These objectives were overwhelmingly supported by mothers and teachers. Using photo-elicitation, participants were engaged and given the chance to suggest priorities and workable solutions, such as the need for doors and locks, water containers, and cleaning materials.

However, a prospective mixed-methods study conducted in Kenya by Wood et al. (2022) identified characteristics that were related to AGYW product-access trajectories as well as impediments to the access to menstrual health products at two times during the COVID-19 pandemic. In accordance with the findings, 52.0% of AGYW had problems getting their hands on menstrual health items; roughly six months later, that number dropped to 30.3%. Product-access problems were made worse during the pandemic for AGYW with secondary or lower education, living with parents, not being the primary earner, and not being able to meet their basic needs. In the intervals between the time points, 38.0% of users had no trouble using the software, and 31.7% of those issues were fixed.

However, issues began for 10.2% of people, and they persisted for 20.1% of people. Living with parents was linked to more problems accessing acquired products than no barriers (AOR=3.21; p=0.05); multinomial models offered more information. Qualitative data indicated that household budgets do not prioritize menstrual health adequately. As a result, AGYW experienced frequent problems getting menstrual health items during the epidemic; the main challenges were financial. Results may reveal persistent gaps in product accessibility that COVID-specific restrictions have increased. Access to menstruation products must be ensured in order to satisfy AGYW's health requirements.

Meanwhile, in Ghana, Gyasi-Gyamerah et al. (2022) examined the prevalence and causes of AGYW exclusion from social activities due to menstruation in both urban and rural settings. The study's cross-sectional data revealed that approximately 21.65% of participants admitted to forgoing particular activities while menstruating, with rates slightly higher for rural AGYW (22.2%) than for urban AGYW, multivariable Poisson regression models showed that urban AGYW who completed elementary education were more prone than those who did not avoid social situations because of menstruation.

Additionally, married AGYW in metropolitan areas were less likely to shun social events due to their periods. For AGYW residing in the second-lowest wealth household in rural areas, the likelihood of being excluded from social activities due to menstruation was higher (APR = 1.34, 95% CI:1.03, 1.75). The region of residence was a significant predictor in both rural and urban groups, but there was a rural-urban difference. The study recommended that given the prevalence of AGYW who shun social activities, governmental and non-governmental organizations working to improve menstrual hygiene and enable young women to participate in them regardless of their monthly menstrual flow should take into account the differences between urban and rural areas in the associated factors identified in the study.

The scope of the Chhaupadi practice (a type of menstrual taboo) was examined, and the methods already in use for its eradication in Nepal were evaluated by Thakuri, Thapa, Singh, Khanal and Khatri (2021). According to the authors 84% of adolescent girls conducted Chhaupadi during their most recent menstruation. The Chhaupadi practice was common if the girls were between the ages of 15 and 17, had illiterate mothers, and were members of nuclear families. The majority of

Chhaupadi-following females (86%) indicated that they have restrictions on their capacity to participate in social and home activities. Higher-level policy texts (statutes, constitutions, and regulations) were examined, and it turned out that these texts included clauses for financial resources, independent monitoring mechanisms, and legal recourse. However, lower-level (directives) and middle-level (policies and plans) papers lacked sufficient financial commitments and impartial monitoring processes.

Also, given similar constraints around childbirth, Kumar and Maity (2022) examined how Nepal's practice of menstrual restrictions and access to maternity healthcare are related to one another. One of the outcomes of interest was the likelihood of giving birth at home without access to expert medical assistance during labor. The study employed a wide range of controls and assessed the sensitivity of the findings to various estimating methodologies. Additionally, the study found that women with menstrual limitations are more likely to give birth at home and only have untrained personnel assist them during labor, which may increase the risk of maternal death. The findings imply that menstrual restricting rituals may have long-lasting negative impacts on women's physical health that are not just limited to the menstrual cycle.

Furthermore, Fry, Niagi, Houck, Avni and Krishna (2022) conducted a policy study in two workplaces in Kenya to examine the relationship between MHH and women's economic empowerment and to find policy modifications that would better accommodate the MHH needs of menstruating employees. Barriers to menstrual employment were discovered in the research's hiring and onboarding practices, employee classification, representation, voice, restroom accessibility, sick leave, and supervisor code of conduct.

2.7 Conceptual Framework for MHM

The conceptual framework was adapted from Thakur et al., (2014). The conceptual framework showed the factors influencing the menstrual hygiene practices and restrictions among young women. The framework is made up of four constructs which are interconnected (societal views, other factors, knowledge (Y), knowledge (A)) with the outcome as restrictions and menstrual hygiene practices.

In the framework it is opined that, other factors (e.g., Socioeconomic status, views of father, family views, neighborhood) directly influences societal views, knowledge of young women and menstrual hygiene practices of young women. Societal views, according to the framework, directly influences the other factors (e.g., Socioeconomic status, views of father, family views, neighborhood), restrictions that young women experience, knowledge of young women and knowledge of adult women. Knowledge of adult women was also noted to influence the knowledge of young women, restrictions, and menstrual hygiene practices of young women. Also, knowledge of young women influences restrictions and menstrual hygiene practices. The restrictions experienced by young women influences their menstrual hygiene practices and the opposite is applicable (Thakur et al., 2014).

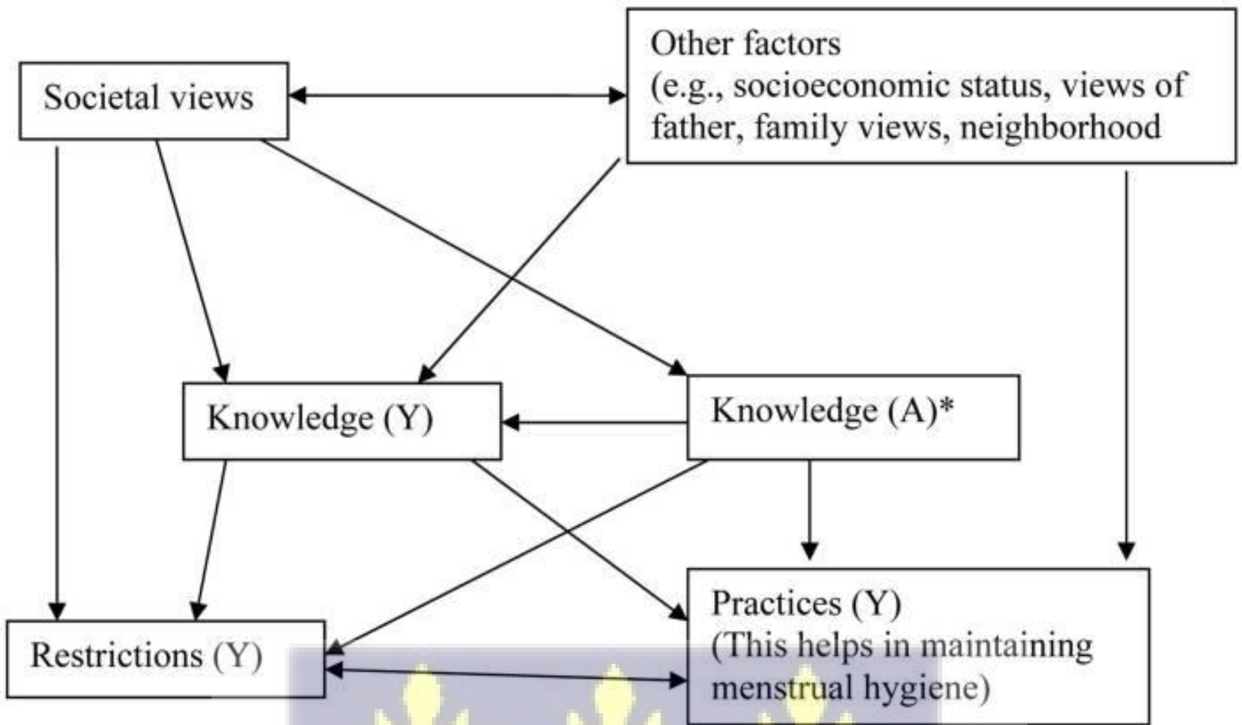

Figure 1: Conceptual framework on Knowledge, Practice and Restrictions related to menstruation.

Source: Thakur et al. (2014)

The conceptual framework was adapted from Thakur et al., (2014) on menstrual hygiene management and developed to suit this study. It explores the relationship among various constructs that ultimately predicts and influences menstrual hygiene management. The framework is made up of four main constructs (demographic factors, WASH factors, knowledge, and other factors) with the outcome being the menstrual hygiene practices (good or bad). The framework also accounts for the anticipated challenges to adequate menstrual hygiene management.

In the framework, it is assumed that demographic characteristics (student's age, place on residence when on vacation, who they stay with when on vacation, religion, boarding status, father's education level and mother's education level) directly influences student's menstrual hygiene management practices (Ahmed, Willi & Abubeker, 2020; Mohammed, 2020). Water Sanitation and Hygiene (WASH) factors such as availability of separate toilets at schools and dormitories, availability of separate bins for disposal of menstrual materials and adequacy of facilities of menstrual needs are also assumed to directly influence menstrual hygiene management among adolescent senior high school girls. Other factors (environmental, socioeconomic factors, source of information) also directly affect MHM. Knowledge on menstrual hygiene and its related practices is also assumed to directly influence menstrual hygiene management. The framework also acknowledges that, there may be challenges that could hinder schoolgirls from engaging in good menstrual hygiene practices.

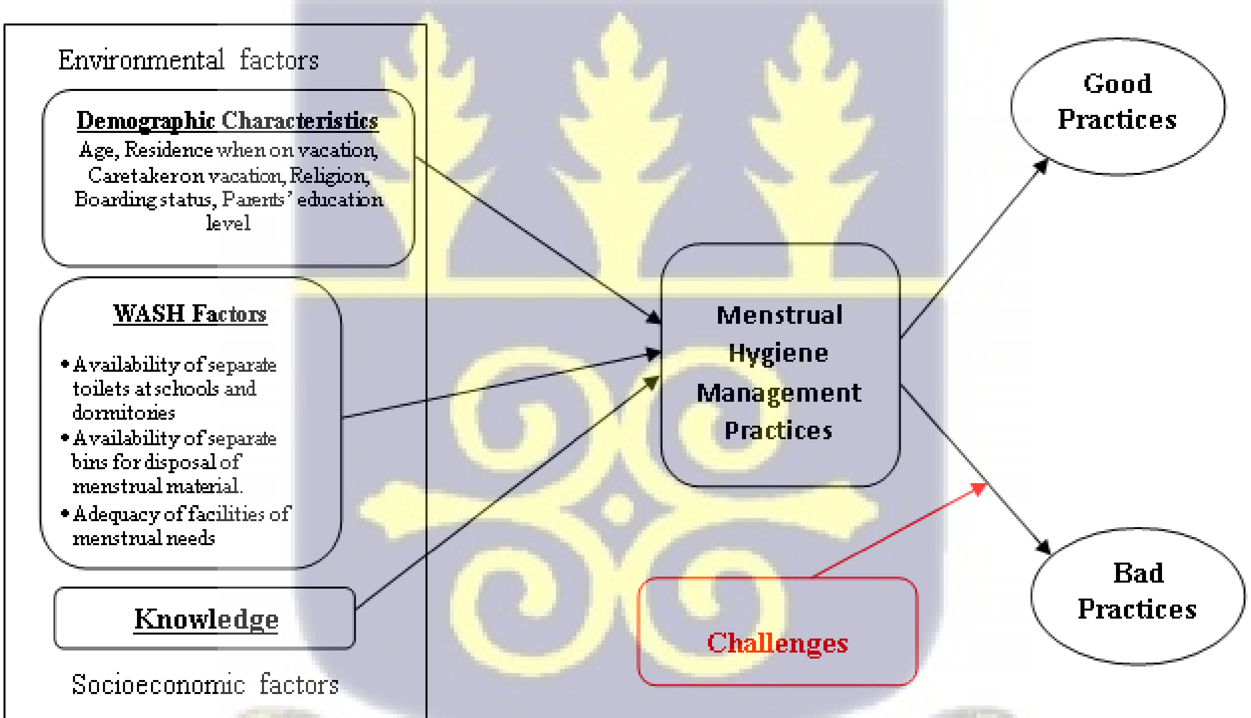

Figure 2: Conceptual Framework

Source: Author's constructs from literature (2022)

CHAPTER THREE

METHODOLOGY

3.0 Introduction

This chapter continues from the literature review and throws light on the methodological approach to the study. While emphasis is placed on the various tools and techniques used to achieve the objectives of the study, specific emphasis is placed on the study approach, design and area. Other key areas of focus will be the study population and sampling including the procedure, inclusion and exclusion criteria, data sources and collection instruments and procedures. The chapter ends with the presentation of the approaches to data analysis and management as well as ethical considerations.

3.1 Research Paradigm

Though several definitions of research paradigm exist, Wilson (2008) provides a commonly accepted definition of research paradigm as a broad set of ideals, techniques and principles that specifically applies to a scientific community and is commonly shared among them as a roadmap towards the various issues that researchers should address as well as the types of meanings that should be accepted. Similarly, Bass and Milosevic (2018) provided a definition of research paradigm that places emphasis on the beliefs and behaviour of the researcher. They explained that research paradigms, among other things, refer to the basic beliefs that influence the behaviour and activities of a researcher or a study.

The importance of aligning with a paradigm cannot be under-emphasized in research. As Bass and Milosevic (2018) posit, aligning with philosophical ideas and, particularly a paradigm, is of great importance to shaping a study, its meaning and implications within the field of study. Thus, this study, to achieve its objectives, adopted the positivist paradigm which supports the existence of a single objective reality. As Aliyu, Bello, Kasim and Martin (2014) explain, positivism connotes an independence between the scientist and the world they study in a way that allows them to provide understanding through direct measurement and observations of reality. In addition to laying emphasis on factual evidence and the establishment of a cause-effect relationship, positivists believe that research issues can be predicted and controlled within reasonable limits in so far as empiricism and deductive reasoning forms the basis for generating testable hypotheses and theories (Aliyu et al., 2014).

By adopting the positivist paradigm, this study supports the scientific nature of the study and quantifiable and measurable features of its assumptions, objectives, tools and techniques. Additionally, it reduces the subjective influence and involvement of the investigator and focuses on the objective processes and results within the frame of the study. This study generally focused on identifying explanatory associations through quantitative approaches and generalized inferences, hence the positivist stance.

3.2 Study Approach/Method

In simple terms, research methodology refers to the general approaches used in carrying out a particular study in line with a chosen paradigm (Leedy & Ormrod, 2001). Based on the objectives and paradigm of the study, a quantitative research approach was adopted. Quick and Hall (2015) have explained that quantitative approaches lay emphasis on the positivist notion that scientific truths are evident and can be assessed with reasonable certainty. Furthermore, it involves the collection of data that can be quantified with emphasis on testing hypothesis, theories, and examining the relationship among variables (Creswell, 2003)

Quantitative research, therefore, involves the collection, management, and evaluation of numerical data using statistics in such a way that the researcher distances herself from the study participants to reduce bias and encourage objectivity (Apuke, 2017). Quantitative research was adopted as it is usually structured, employs standardized instruments to gather data from a defined sample, and supports statistical analysis as the basis of making inferences from the data. The quantitative approach was also considered appropriate since it supports studies that require the collection of data on a phenomenon involving a large group within a constrained time (Rahman, 2020).

3.3 Research Design

Generally, a research design serves as the plan or the main guide for all parts of the study including how hypothesis and research questions are answered based on empirical data (Creswell, 2008). It therefore provides key insights to what variables will be essential, how they are measured, time, process and location of data collection, as well as analytical processes and frames for the study (Boru, 2018).

Though several designs were available, the cross-sectional survey design was deemed appropriate and adopted for this study because of its suitability and applicability. A cross-sectional study design is used for population-based surveys to give a snapshot of what the researcher intends to study (Setia, 2016). It collects data on behaviours, knowledge, disease prevalence, attitudes and opinions of respondents (Polit & Beck, 2014) and are relatively faster and less costly (Setia, 2016). In its practical sense, cross-sectional surveys ideally occur at one point in time and provides a snapshot of the core issue to be studied (Connelly, 2016). Also, during cross-sectional studies, the outcome and exposures of respondents are measured at the same time (Setia, 2016).

Hofer, Silwinski, & Flaherty (2002) however caution that when used in circumstances where the variable changes over time, the results may be limited or potentially biased. For quantitative studies, it offers a plausible explanation of trends, attitudes or opinions of a population based on assessments on a representative sample which further facilitates the studying of relationships between variables and differences between subgroups in a population (Haradhan, 2020).

When employed in health-related studies, cross sectional surveys allow for the collection and analysis of timely information including attitudes and other key data that may not be easily derived and assessed from observation of large samples (McIntyre, 2011). Despite its merits, its static nature may not facilitate and account for changes in the population as well as the circumstances of the sample. Wang and Cheng (2020) report of challenges with access, insecurities and stratifying the population. Yet, cross-sectional surveys remain the most suitable for this study in view of its merits.

3.4 Overview of Study Area

The study was conducted in the New Juaben North Municipal Assembly in the Eastern Region of Ghana. As one of the newly created districts in Ghana, the assembly was carved out of the then New Juaben Municipal Assembly in line with Legislative Instrument LI 2302 of 2017 and officially inaugurated on 15th March, 2018. The Assembly is located in the central part of the Eastern Region with its capital being Effiduase. The assembly has a total surface area of 117.6km², a population density of 792.6/km² and an annual population change of 4.4% (NJNMA, 2020).

Figure 3: Map showing New Juaben North Municipal Assembly
Source: City population maps (2021)

According to the 2021 population and housing census, the population of the municipality stands at 93,201 with 46,799 females and 46,402 males (GSS, 2022). Individuals between the ages of 10 - 19 years account for the largest share of the population (23,382) (GSS, 2022). This was a significant factor in the district's selection for the study, as it is reflective of the study's desired age range with first and early experiences of menarche. Additionally, other key studies like Adoboah (2012) and Abrah (2021) conducted in the area had laid the grounds for this study.

The assembly has both private and government owned educational facilities evenly distributed across the kindergarten/nursery, primary, junior high and senior high school levels. It also has one tertiary institution and many vocational institutes (NJNMA, 2020). However, based on preliminary fieldwork and evidence from Abrah (2021), emphasis was placed on Senior High Schools as the source of respondents within the district as they represented the clusters of females in their teens with early experiences of menarche. Currently, the assembly has 5 public senior high schools namely Oyoko Methodist Senior High School (OMESS), Pope John Senior High School (POJOSS), SDA Senior High School (SEDASS), Ghana Senior High School (GHANASS) and Pentecost Senior High School (PENSEC).

3.5 Study Population

In studies like this, the data management process begins with the definition of the study population from which a representative sample is drawn. Generally, study populations may be defined by geographic location, age, sex, with additional definitions of attributes and variables such as occupation, religion and ethnic group (Banerjee & Chaudhury, 2010).

In line with the above, the target population of this study consisted of students from the 5 public SHS within the area of study. Currently, the Municipal Education Directorate estimates that there are about 15000 students enrolled in the 5 SHS in the area. Letters were therefore sent to all the 5 public senior high schools to seek approval to collect data in September, 2022. After a period of one month, the approval for data collection was received from two (2) schools namely Ghana Senior High School (GHANASS) and Oyoko Methodist Senior High School (OMESS).

Ghana Senior High School is a mixed school that provides both day and boarding facilities. It offers courses in General Science, Visual Arts, Agriculture, Home Economics, Business and General Arts. The school currently has a student population of over two thousand three hundred (2,300) of which one thousand one hundred and three (1163) are females with a staff population of about eighty (80). Oyoko Methodist Senior High School is also a mixed school with both day and boarding facilities and offers courses in Agriculture, Business, Home Economics, Visual Arts, General Arts and General Science. OMESS has a student population of about three thousand (3000) of which one thousand six hundred and thirty-seven (1,637) are females with a staff strength of about 90. The study population based on the female population in these schools was 2800.

3.6 Inclusion and Exclusion Criteria

The study included only schools that had given express approval for the study as well as individual students who had voluntarily consented to participate in the study under the supervision of their teachers as they were under 18 years. It also included only female students attending either Oyoko Methodist Senior High School or Ghana Senior High School who were present during the data collection period.

Also, female students who expressed some discomfort with the study instruments, expressly declined participation or were not available during the data collection period were excluded.

3.7 Sample Size

The sample size was calculated using the normal approximation to the hypergeometric distribution formula as indicated below with 95% confidence interval and 4% margin of error.

$$n = \frac{Nz^2pq}{E^2(N-1) + z^2pq}$$

$$n = \frac{2800(1.96^2) \times 0.5 \times 0.5}{0.04^2(2800-1) + 1.96^2 \times 0.5 \times 0.5}$$

$$n = \frac{10756.48(0.25)}{0.0016\ (2799) + 3.8416(0.25)}$$

$$n = \frac{2689.12}{4.4784 + 0.9604}$$

$$n = \frac{2689.12}{5.4388}$$

$$n = 494.43$$

Hence, the sample size for the study was 494 students.

Where:

n = is the minimum sample size required

Z = standard normal deviation at 95% confidence interval

e = is the margin of error (0.04)

p = is the estimated proportion

q = (1 - p)

N= population size

After a 10% non-response rate was calculated;

$$non\ response = 494\ \times 10\%$$

$$non\ response = 49.4$$

$$n = 49 + 494$$

$$n = 543$$

The minimum sample size calculated was 543. However, a total of 557 students were recruited to participate in the study.

3.8 Sampling Procedure

Sampling generally refers to the defined set of procedures and steps adopted by a study and used to select a portion of the study population that is reflective of the general characteristics and normal choices of the population (Onwuegbuzie & Collins, 2007). Quite apart from reducing the breadth and scope of the study without significantly constraining its representativeness and applicability, sampling allows the study to rationalize the data collection and management processes.

A simple random technique was used to select female students in both schools until the sample size was achieved. According to Thompson (2012 p. 11), simple random sampling is “a sampling design in which *n* distinct items are selected from the *N* items in the population in such a way that every possible combination of *N* items is equally likely to be the sample selected". The researcher had written "Yes" and "No" on papers and folded them. There were as many "Yes" responses as the researcher wanted for the sample size. Female students were made to select the papers randomly. Those who selected "Yes" were recruited into the study after their consent was given. Those who selected "No" were excluded from the study. Permission had been given by the respective schools for the data collection to be done within a week and during the break times and after daily lessons so as not to disrupt their learning routines. After the one-week period, a total of 252 responses had been obtained from students at the Ghana Senior High School and 305 responses from the Oyoko Methodist Senior High School.

3.9 Data Collection Tools

Data was collected with a structured questionnaire consisting of mostly close-ended questions. Questions were developed in line with other studies done on menstrual hygiene management (Davis et al., 2018; Kumbeni et al., 2022; Tegegne & Sisay, 2014) and to fit the objectives of the study. The instrument consisted of four parts with section 1 asking questions on demographic characteristics. The second and third sections asked questions on knowledge assessment and MHM practices respectively. The final section was on barriers to adequate menstrual hygiene management.

3.10 Data Collection Procedure

The questionnaires were administered face-to-face with the aid of some teachers tasked by the heads of the respective schools to assist with sample recruitment. Students were approached during their break times and after the close of lessons for the day for possible participation in the study. Some students also willingly approached the data collection team and indicated their willingness to participate in the study. Written informed consent was sought from all students for data collection and their teachers also provided guardian consent for the girls for the data collection. Questionnaires were then administered after consent was sought. The teachers served as guardians and provided guardian consents for respondents who were below 18 years hence, they had no influence on the data collection process or the responses of the students. The researcher and research assistants administered the questionnaires in the English Language. Most of the participants completed the questionnaires on their own and others were assisted by the research team. An average of 15 minutes was used in the completion of a questionnaire.

3.11 Data Management

Data collected was entered into Microsoft Excel Software (2020) for cleaning and validation. All data was stored on a personal computer with a secured password. Data was then exported to STATA/MP version 17 (STATA Corp) for analysis. Hard copy questionnaires were locked with access to only the researcher and supervisors. Data will be kept for 5 years before destruction.

3.12 Data Quality Assurance

To ensure the quality of data, academic experts in MHM and WASH were made to review the questionnaire to check relevance of questions. A pre-test was conducted in 1 senior high school in the Greater Accra Region using 50 female students. The questionnaire was pre-tested to check for validity and reliability. All discrepancies and unclear questions from the expert review and the pre-test were corrected before the main study. Three (3) research assistants were recruited and thoroughly trained on the subject area and the data collection process to participate in data collection and entry.

3.13 Study Variables

The study was made up of dependent and independent variables relating to the study objectives.

Table 1: Study Variables

Variable	**Scale of Measurement**	**Levels**
Dependent		
Menstrual Hygiene Practices	Categorical (Binary)	Good and Poor
Independent		
Age	Continuous/Categorical	≤ 14 years, 15-17 years, ≥ 19 years
Level	Categorical	Form 1, Form 2
Religion	Categorical	Islam, Christianity, Traditional
School residency status	Categorical	Day, Boarding
Who student stays with	Categorical	Both Parents, Mother Only, Father Only, Household without elder female member, Household with elder female member other than mother, Alone
Mother's educational level	Categorical	No Education, Primary, JHS, SHS, Tertiary, Technical/Vocational
Father's educational level	Categorical	No Education, Primary, JHS, SHS, Tertiary, Technical/Vocational
Bins identified for disposal of pads only	Categorical	Yes, No
Separate toilets on campus and dormitories	Categorical	Yes, No
Adequacy of facilities for menstrual needs	Categorical	Yes, No
Knowledge level	Categorical	Poor, Moderate, Good

Source: Fieldwork (2022)

3.14 Data Analysis

Data was analyzed using STATA (MP) 17 (StataCorp, College Station, TX, USA). Prior to the regression, simple descriptive statistics were conducted for demographic, knowledge, and practice variables. In assessing knowledge, 7 questions were used. Out of the total score of 7, the scores were rounded to 100%. Any score less than 50% was graded as "poor" any score between 50% to 70% were graded as "moderate" and scores between 80% to 100% were graded as "good". A total of 10 statements elicited menstrual hygiene practices with a score of 1 for good practices and 0 for poor practices. The scores were rounded to 100%. Any score less than 80% was considered as poor practices and scored 80% and above were considered good practices. A multivariate logistic regression was conducted to determine the factors that influenced menstrual hygiene practices. All p-values ≤ 0.05 were considered statistically significant.

Logistic regression equation

$$Log(\Lambda_i) = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \cdots + \beta_n X_n$$

Where Λ_i : Dependent variables

β: Regression coefficients for explanatory variables

X : Explanatory variables

3.15 Ethical Consideration

Recognized ethical principles in research such as informed consent, voluntary participation, privacy, and confidentiality among others were duly observed by first asking respondents to sign a consent form. Also, selected schools gave approval before the data collection process commenced. Participation was purely voluntary, and no participant was coerced or lured into participating. Respondents were assured of their confidentiality and data destroyed after the final analysis. Also, respondents were at liberty to opt-out at any stage of the process without being questioned.

CHAPTER FOUR

DATA PRESENTATION, ANALYSIS AND DISCUSSION

4.1 Introduction

This chapter presents the data analysis in the study and discusses the results in relation to existing literature. Firstly, the socio-demographic characteristics are presented. Thereafter, the knowledge of respondents on menstrual hygiene, menstrual hygiene practices and factors influencing the practices and challenges in menstrual hygiene management are presented and discussed. Results are presented in frequency tables, pie charts and bar charts.

4.2 Demographic Characteristics of Respondents

A total of 557 participants were included in the study. Table 2 shows the socio-demographic characteristics of participants. The mean age was 16.50 ± 0.96 years with a minimum age of 14 years and maximum of 19 years. Out of the total responses, majority of the students 345 (62.39%) were from the Eastern Region followed by the Greater Accra Region 165 (29.84%). The remaining were spread sparingly among all the other regions in Ghana. More than half of the students were in their first year 322 (57.91%) and the rest in second year 234 (42.09%). For their religious affiliations, 509 (91%) of the students were Christians whiles 43 (7.75%) were Muslims with a few traditionalists. More than half of the students who participated in the study were in the boarding house 419 (75.63%) and the rest were day students.

The students were asked about whom they stayed with during vacation. 335 (60.36%) stayed with both parents while 142 (25.59%) stayed with their mothers alone with 30 (5.41%) staying with their fathers alone. The study further sought to understand the demographic characteristics of their parents. Most of the mothers had at least junior high school 172 (31.05%) and senior high school education 147 (26.53%) followed by tertiary education 98 (17.69%). For the fathers, 172 (31.39%) had senior high school education, 171 (31.20%) had tertiary education and 17.69% had junior high school education. These findings are presented in table 2 below:

Table 2: Demographic Characteristics

	Frequencies	Percentages
Age: Mean: 16.50 ±0.96 CI: [16.42- 16.58] Min: 14 Max: 19		
Menarche: Mean: 13.19 ± 1.44 CI: [13.07 – 13.32]		
Region of Residence		
Ashanti Region	7	1.27
Bono East	5	0.90
Brong Ahafo	9	1.63
Central Region	17	3.07
Eastern Region	345	62.39
Greater Accra Region	165	29.84
Northern Region	1	0.18
Western Region	4	0.72
Total	**553**	**100.00**
Level of Study		
Form 1	322	57.91
Form 2	234	42.09
Total	**556**	**100.00**
Religion		
Islam	43	7.75
Christianity	509	91.71
Traditional	3	0.54
Total	**555**	**100.00**
Accommodation Status		
Day	133	24.01
Boarding	419	75.63

Total	**554**	**100.00**
With whom do you live with when not in school		
Both Parents	335	60.36
Mother Only	142	25.59
Father Only	30	5.41
Household without elder female member	7	1.26
Household with elder female member other than mother	35	6.31
Alone	6	1.08
Total	**555**	**100.00**
Mother's Educational Level		
No Education	30	5.42
Primary	47	8.48
JHS	172	31.05
SHS	147	26.53
Tertiary	98	17.69
Technical/Vocational	59	10.65
Total	**554**	**100.00**
Father's Educational Level		
No Education	27	4.93
Primary	19	3.47
JHS	90	16.42
SHS	172	31.39
Tertiary	171	31.20
Technical/Vocational	69	12.59
Total	**548**	**100.00**

Source: Fieldwork (2022)

Further information was sought from the students about their menstrual histories. Almost all (99.46%) of the students had started menstruating at the time of the study with a few (0.54%) who had not yet started their menses (Figure 4). The mean age at menarche was 13.19 ± 1.44 years (table 2).

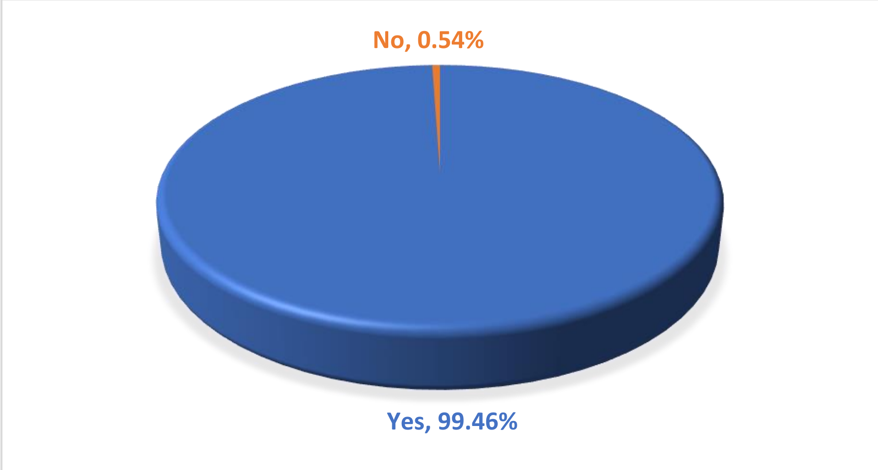

Figure 4: Students who have started menstruating
Source: Fieldwork (2022)

The place students experience their first menstrual period is essential to reducing the fear of the occurrence. When asked where they had their first menstrual period, majority (280) reported having it at home which accounted for 50.8% of the total respondents, followed by those who had it in school during their junior high school days and then primary level. These findings are displayed in Figure 5 below.

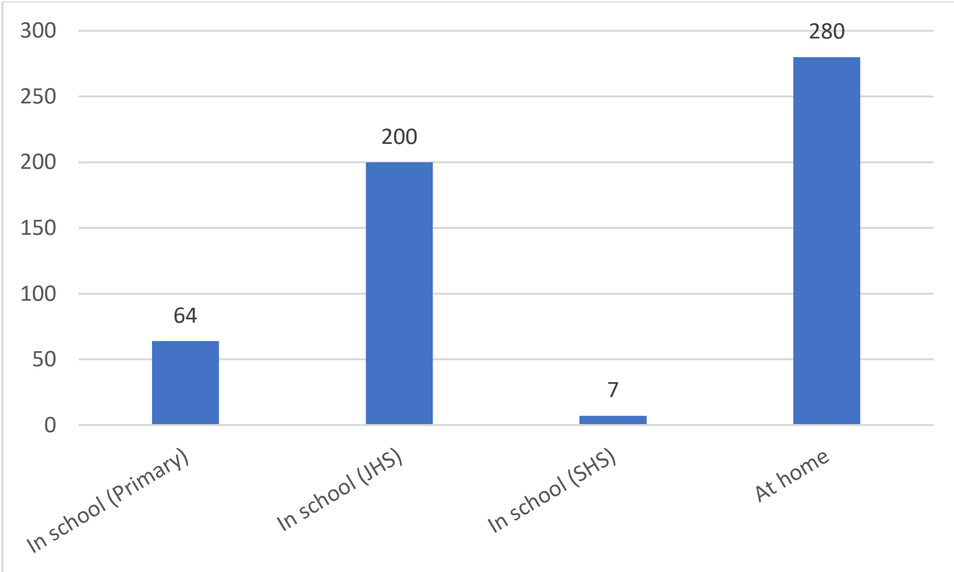

Figure 5: Where students had their first menstruation.
Source: Fieldwork (2022)

Similarly, it is important for females, especially adolescent females, to receive guidance before and during their periods of menstruation to help them manage their menstruation well. According to Figure 6, a large number of the students indicated that they received guidance from other people before their first menstrual periods. Majority of the students were guided by their mothers (356) when they had their first menstruation/menarche, followed by their friends (47), older siblings (44) and teachers (41). 29 students reported that no one guided them during their first menstrual period.

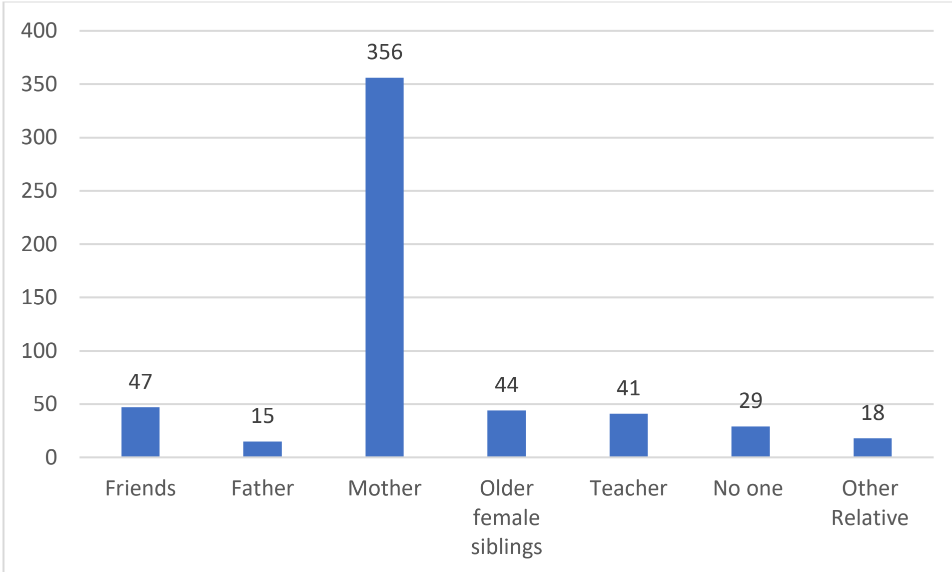

Figure 6: Who students received guidance from
Source: Fieldwork (2022)

4.3 Knowledge of students on menstruation

The study sought to assess the knowledge of students on menstruation and its related practices. Results are displayed in tables, bar charts and pie charts to enhance clarity. First and foremost, the students were asked about what they knew about menstruation. Almost all (529) of the students mentioned that menstruation is the natural shedding of blood on a monthly basis. Few (42) knew that menstruation is a physiological process of the body. Very few thought that menstruation was a disease (12) and a type of curse received by women (13). (Figure 7).

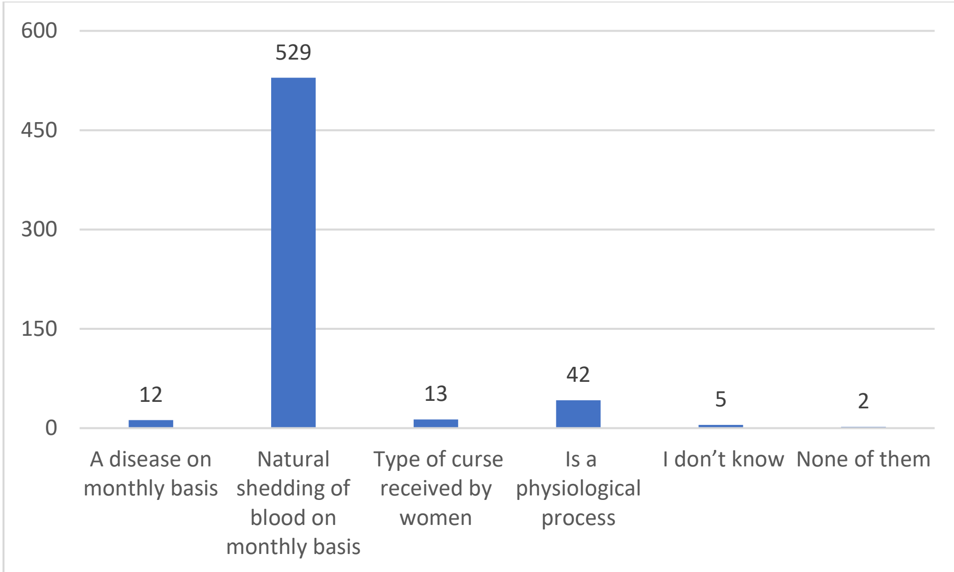

Figure 7: What is Menstruation?
Source: Fieldwork (2022)

Further questions were asked on the causes of menstruation. From table 3, it was evident that most of the students 476 (87.50%) knew that menstruation was caused and regulated by hormones. Very few mentioned that it was a curse of God and caused by diseases while 43 (7.90%) did not know. Also, more than half 355 (65.38%) knew that the menstrual blood comes from the uterus (womb) while 121 (22.28%) indicated that it originated from the abdomen. 34 (6.26%) mentioned that the blood was from the bladder while 33 (6.08%) had no idea. On the duration of normal menstruation, 507 (92.01%) indicated that it was between two (2) to seven (days) while 29 (5.25%) mentioned greater than 7 days. Also, 12 (2.18%) did not know the duration of normal menstruation. To further elicit their knowledge, the students were also asked the normal duration between two menstrual cycles (in days). 333 (61.78%) indicated 20-35 days while 77 (14.29%) indicated less than 20 days. 113 (20.96%) indicated they did not know. Majority of the students 502 (90.61%) indicated that they were told about menstruation before they had their first menstruation.

Table 3: Knowledge on menstruation

	Freq.	Percent
What is the cause of menstruation		
Curse of God	20	3.68
Caused by Diseases	4	0.74
Hormones	476	87.50
Don't Know	43	7.90
Total	544	100.00
Which Organ does the menstrual blood come from?		
Uterus/Womb	355	65.38
Bladder	34	6.26
Abdomen	121	22.28
Don't know	33	6.08
Total	543	100.00
What is the duration of normal menstruation?		
Less than 2 days	2	0.36
2-7 days	507	92.01
> 7 days	29	5.26
Don't Know	12	2.18
Total	551	100.00
What is the interval between two menstrual cycles?		
< 20 days	77	14.29
20 - 35 days	333	61.78
> 35 days	14	2.60
Don't know	113	20.96
Total	539	100.00
Did anyone tell you about menstruation before your first menstruation occurred?		
No	39	7.04
Yes	502	90.61
Don't Know/Don't Remember	12	2.17

Source: Fieldwork (2022)

On the source of their information, majority mentioned that they had the information from teachers (301), followed by their mothers (236) and friends (210). Aside from these other sources stated were their sisters (143) and the internet (84). (Figure 8). When asked if menstruation is a lifelong process, 55.02% said No while 44.98% affirmed that menstruation is a lifelong process. (Figure 9).

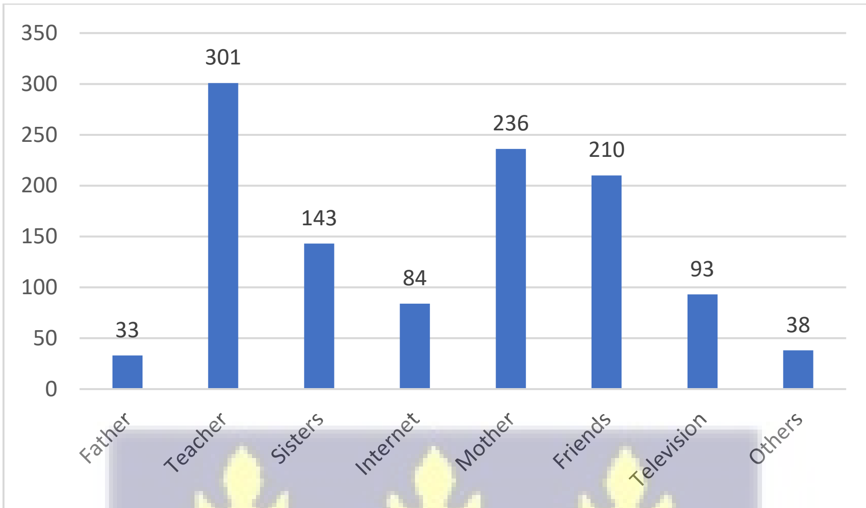

Figure 8: Source of information
Source: Fieldwork (2022)

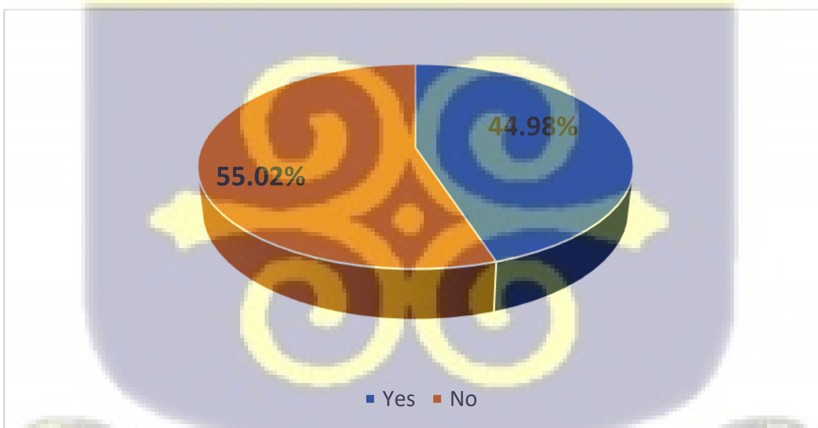

Figure 9: Menstruation is a lifelong process
Source: Fieldwork (2022)

In order to further assess the knowledge of students, participants were asked about the types of menstrual products they know. Almost all (524) of the participants knew about disposable pads.

114 participants knew about menstrual cloth, 67 about reusable pads, 63 about tampons and 55 about menstrual cups.

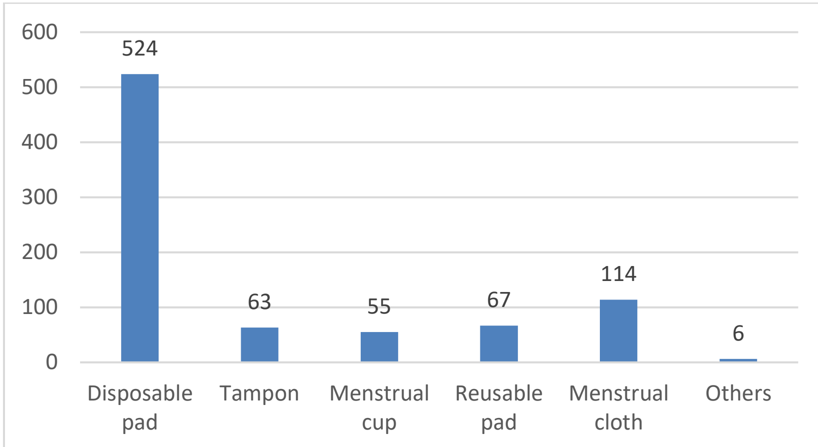

Figure 10: Which menstrual products are you aware of?
Source: Fieldwork (2022)

When asked which of the menstrual products participants have used, 94.51% have used the disposable pads. Only a few students have used tampons (2.38%), Menstrual cup (1.10%), reusable pad (0.92%) and menstrual cloth (0.73%).

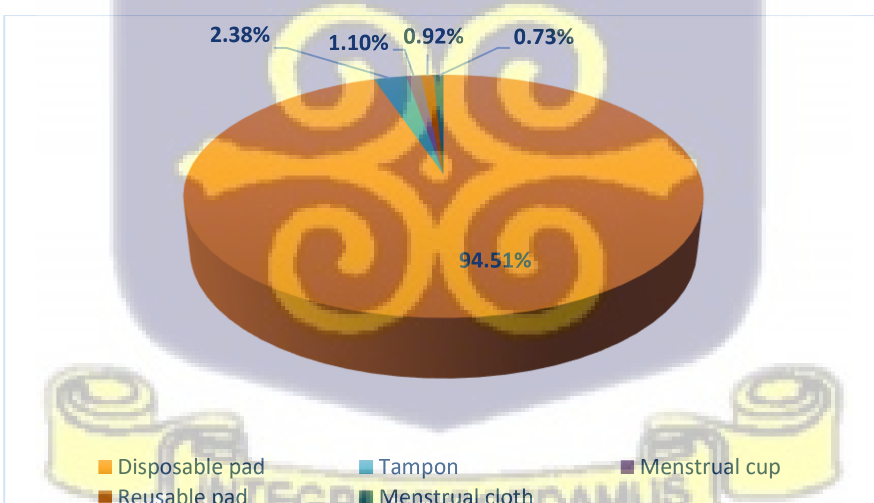

Figure 11: Menstrual products ever used.
Source: Fieldwork (2022)

Students were asked to rate how knowledgeable they are on issues of menstruation and menstrual practices. Results on Figure 12 below shows that 200 participants, accounting for 36.4% of the total participants rated their knowledge level as "high". Also, 179 (32.6%) students rated their knowledge level as "very high". Very few students said they had low and very low knowledge on menstruation and its related practices.

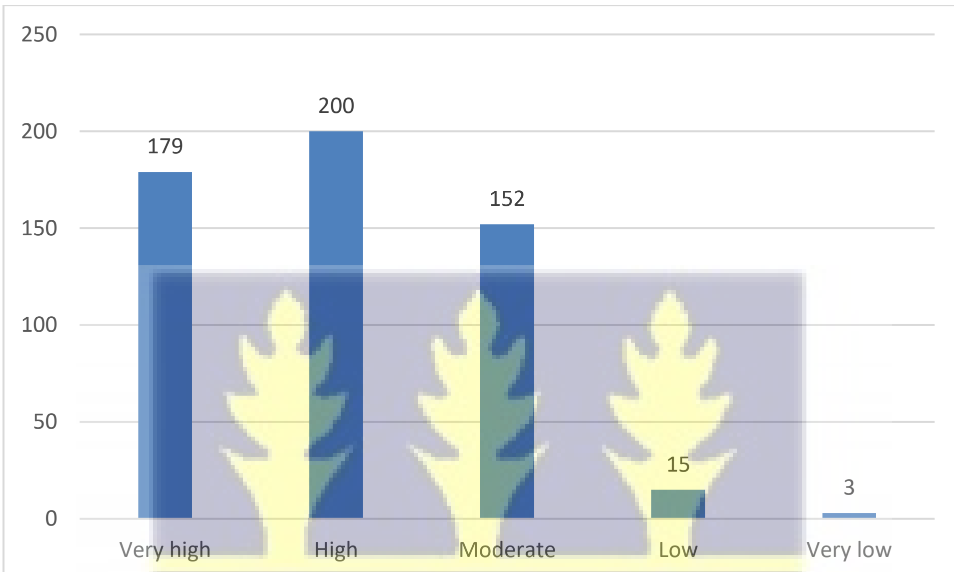

Figure 12: Self-Knowledge assessment
Source: Fieldwork (2022)

Apart from the self-knowledge assessment, we assessed the students' knowledge using 7 knowledge questions on menstruation. Out of the total score of 7, any score less than 3 was graded as poor, scores between 4 and 5 were graded as moderate and scores above 5 were graded as good. Even though in the self-assessment, most of the students reported they had high and very high knowledge. However, from the assessment of the researcher, overall, 342 (61.22%) of the students exhibited good knowledge, 119 (21.36%) had moderate knowledge and 97 (17.21%) had poor knowledge on menstruation and its associated practices. (Table 4).

Table 4: Knowledge rating on menstruation

	Frequency	Percentage
Poor	97	17.41
Moderate	119	21.36
Good	341	61.22
Total	557	100.00

Source: Fieldwork (2022)

4.4 Menstrual hygiene management practices

The study sought to further assess the MHMP predominantly adopted by students. Upon enquiry about the main absorbent material used during menstruation, 532 (97.44%) indicated they use the disposable sanitary pads. Very few used the cloth, reusable sanitary pads, tampons and menstrual cups. When given the choice of preference, majority 511 (93.25%) still preferred the disposable sanitary pads, with a few more preferring tampons and menstrual cups.

Table 5: Menstrual hygiene practices

	Frequency	Percentage
What is the main absorbent material you use during menstruation?		
Disposable Sanitary pads	532	97.44
Napkin/Cloth/Towel	2	0.37
Reusable sanitary pads	4	0.73
Tampon	5	0.92
Menstrual cup	2	0.37
Total	546	100.00
Which one would you prefer the most if given the choice?		
Disposable Sanitary pads	511	93.25
Napkin/Cloth/Towel	1	0.18
Reusable sanitary pads	6	1.09
Tampon	16	2.92

Menstrual cup	9	1.64
Cotton	1	0.18
Total	548	100.00

Source: Fieldwork (2022)

When asked for the reason(s) behind their preference of menstrual products, 25% indicated that their choice of product was based on its comfort, 21% made their decisions because their choices were easily available. 18% said their choices were on the basis that the product makes them not fear stains, 17% of the respondents made their choices because of the affordability of the product. Other reasons were the easy disposal (8%) and durability (6%). (Figure 13).

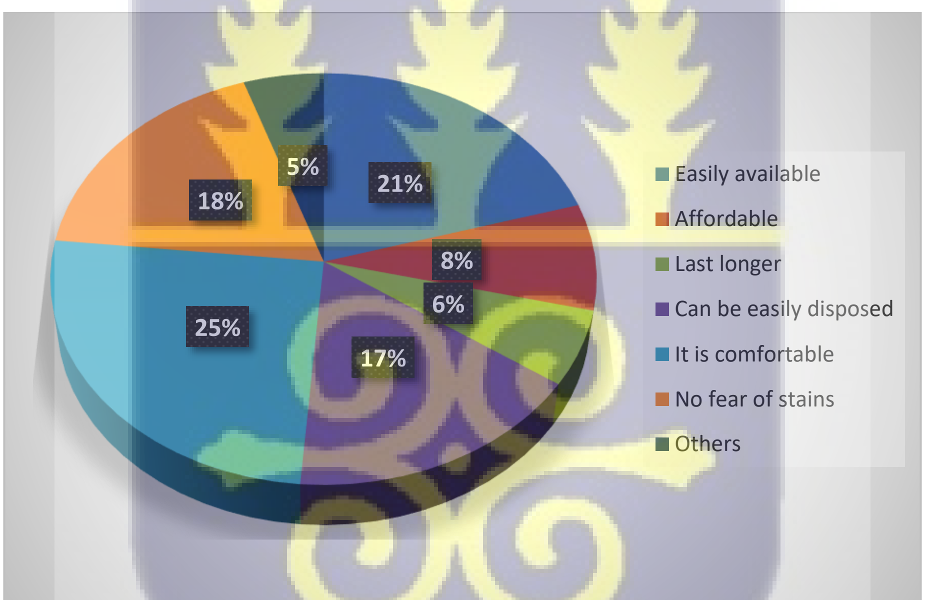

Figure 13: Reasons for preferred menstrual product
Source: Fieldwork (2022)

To further assess their practices, the study asked about the number of times students changed their sanitary pads in a day during their menstrual period. Results from Figure 14 shows that most students change their sanitary pads twice (255) and three or more times (254) daily. Only a few changed their sanitary pads once (28). Owing to the knowledge that females experience differences in heaviness of flow it was predictable that they would have differences in the frequency of changing their sanitary pads.

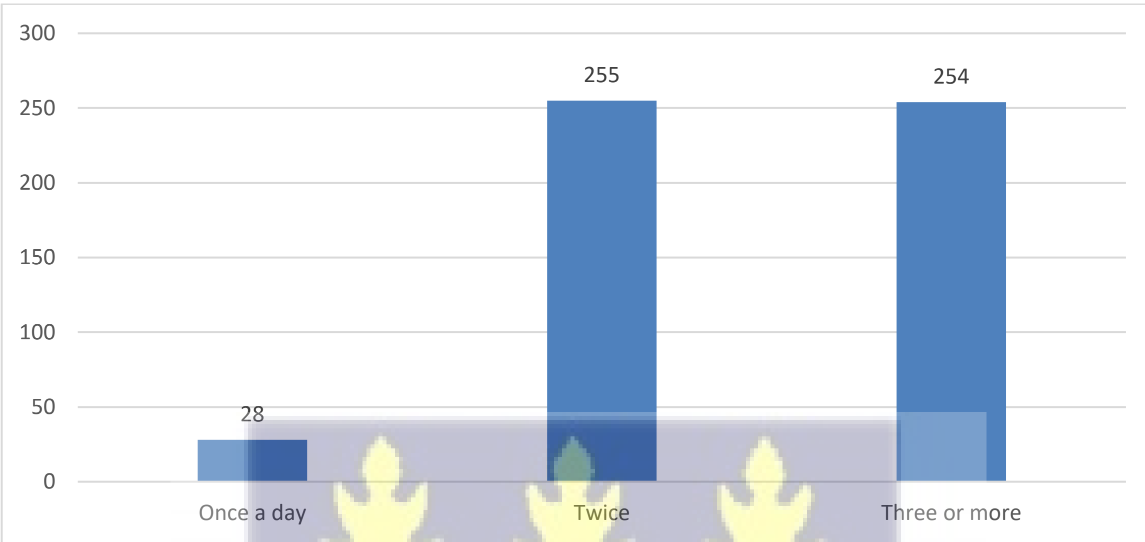

Figure 14: How many times do you change your sanitary pads in a day
Source: Fieldwork (2022)

As part of menstrual hygiene practices, we sought to find out how students disposed of their used sanitary pads when in school and at home. When at home, most of the students (296) burn their used sanitary pads as compared to being at school (143). However, an opposite trend was seen in relation to disposal in the bin. More students disposed of their used sanitary pads in the bins in school (261) than they do at home (183). A similar trend was seen with disposal in the toilets. 120 students drop it in the toilet at school as compared to 53 at home. This could largely be due to the reason that students do not have the facility to burn their pads in school as compared to home. Hence, they burn more at home and drop more in the bin and toilet when in school since that seem to be more convenient. Very few students bury their pads at home and at school or drop them in the drain.

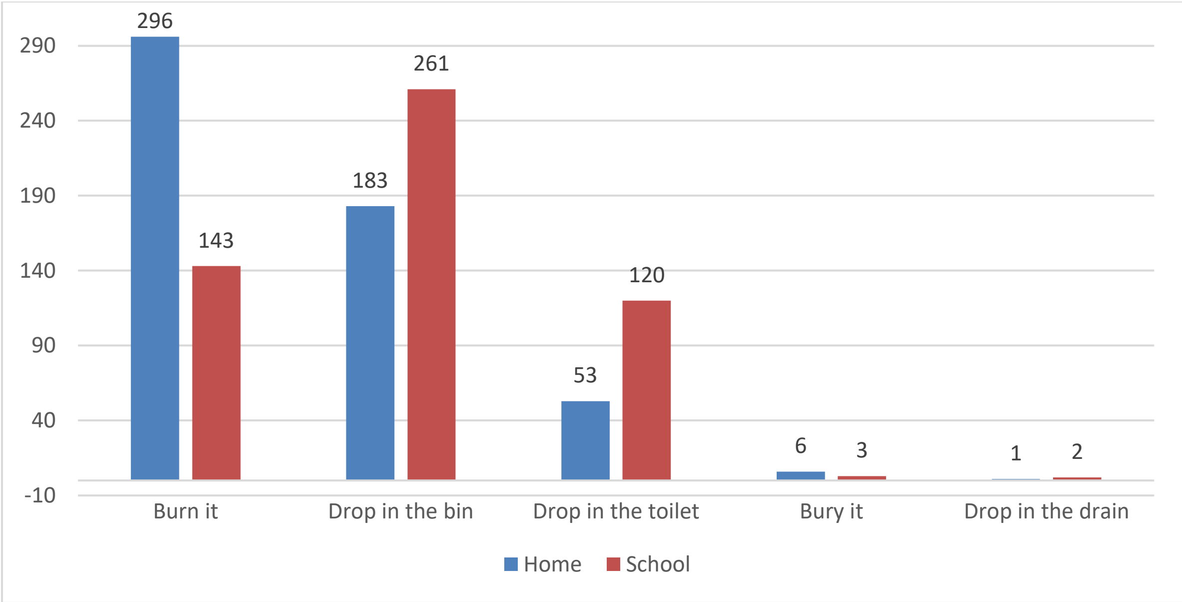

Figure 15: Where/how do you dispose your pads in school/home
Source: Fieldwork (2022)

How used sanitary pads are disposed are an integral part of ensuring that menstrual processes are handled hygienically. As part of understanding their practices. Students were also asked if they wrap their used sanitary pads before disposal. The findings of the study revealed that 95% of the students often wrap their used sanitary pads before disposal while 5% do not wrap them before disposal.

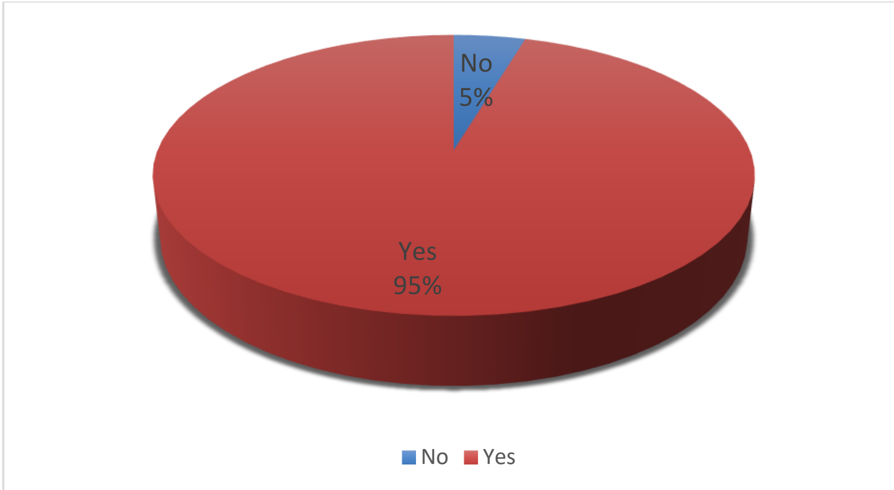

Figure 16: Do you wrap your sanitary before disposing of it?
Source: Fieldwork (2022)

Further questions were asked in order to assess the hygienic practices of students. Since menstruation is characterized by bleeding and discharges, personal hygiene is very important for women during their menstrual periods. When asked whether they take their bath during menstruation, almost all (99%) of the students responded Yes. Very few (1%) indicated that they do not bath during menstruation. (Figure 17).

Figure 17: Do you take your bath during menstruation?
Source: Fieldwork (2022)

Regarding the frequency of bathing, almost all the students 523 (96.67%) had their bath twice a day during their menstrual periods while a few 17 (3.14%) take their bath once a day. (Figure 18).

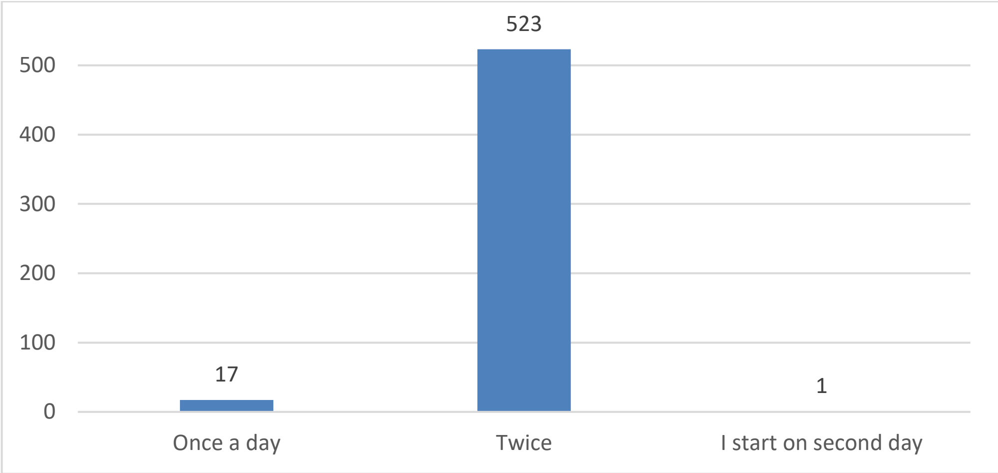

Figure 18: Frequency of bathing during menstruation
Source: Fieldwork (2022)

In respect to the cleaning of the genital area during their menstrual period, 99.08% of students said they clean their genitals during menstruation while 0.92% do not clean. (Figure 19). We further asked about what they use to clean their genitalia. Most of the students 324 (61.13%) indicated they used only water for cleaning their genitals, 114 (21.51%) students mentioned they used water and antiseptic, 89 (16.79%) indicated they used water and soap for cleaning while the rest of the students stated that they used only wipes/towels (Figure 20).

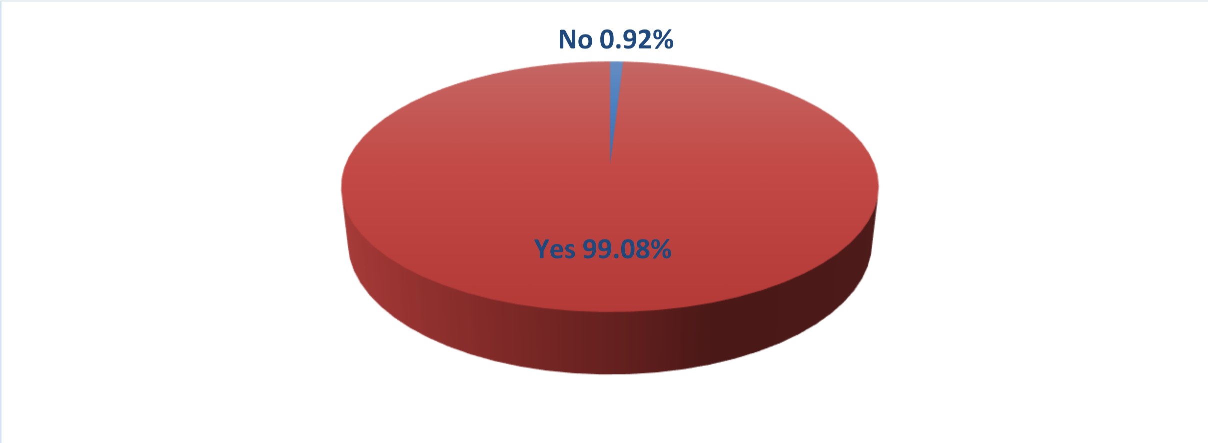

Figure 19: Do you clean genital area during menstruation?
Source: Fieldwork (2022)

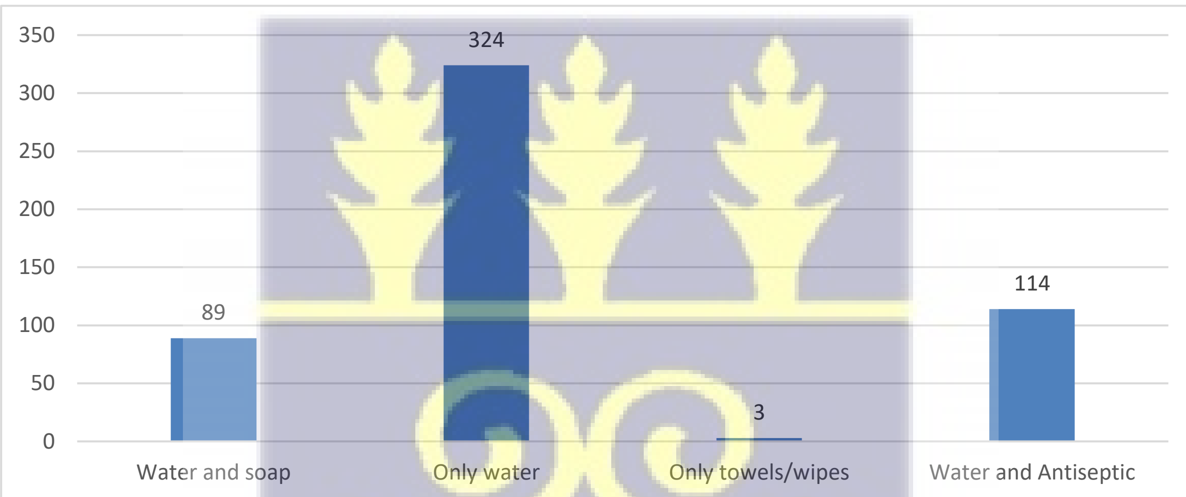

Figure 20: What do you use to clean your genitals
Source: Fieldwork (2022)

Due to the variations in menstruation among females and the differences in their approach, as part of the practices, the study sought to know some of the remedies taken during menstruation. Almost half 239 (47.90%) of the students mentioned that they rest during their menstrual periods. 158 (31.66%) students indicated that they take medications as remedies. 74 mentioned that they usually engage in activities while others 25 (5%) isolate themselves. Few students indicated that they resort to prayers as a remedy. (Figure 21).

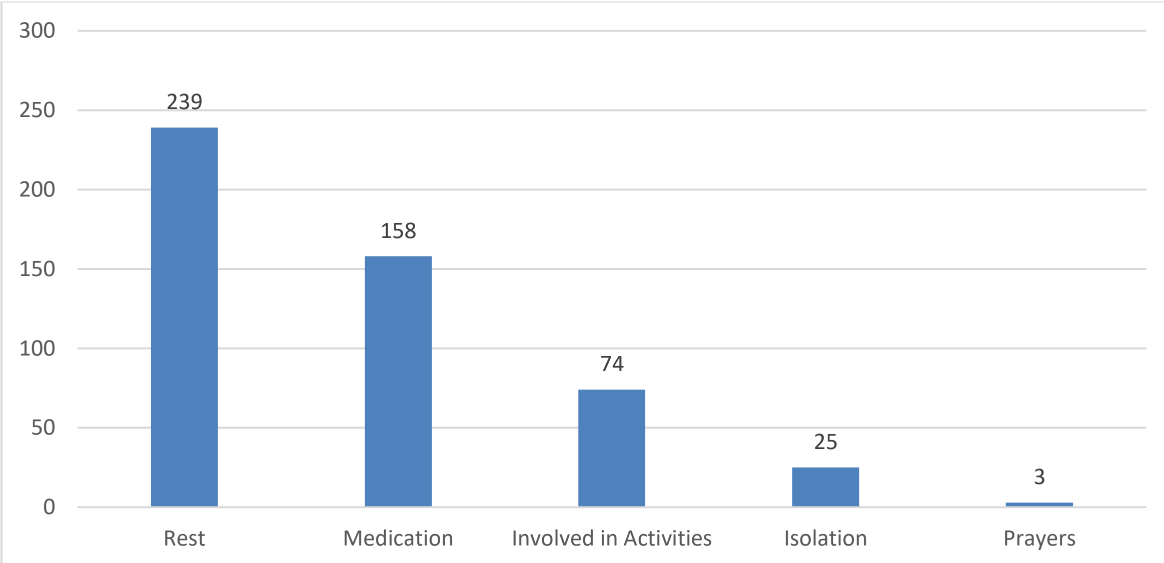

Figure 21: What remedies do you take during menstruation?
Source: Fieldwork (2022)

Overall, a little more than half 318 (57.09%) of the students predominantly adopted good hygiene practices during menstruation while 231 (42.91%) were involved in poor practices.

Table 6: Assessment of Menstrual Hygiene Practices

	Frequency	**Percentage**
Poor	231	42.91
Good	318	57.09
Total	557	100

Source: Fieldwork (2022)

4.5 Factors influencing menstrual hygiene practices

The study sought to examine the factors that influence menstrual hygiene practices among female students. A multivariate logistic regression was conducted with the menstrual hygiene practices as a dependent variable. The independent variables included the age, level, religion, school residency status, who student stays with during vacation, mother's educational level, father's educational level, availability of bins for disposal of pads, availability of water at school toilets, availability of separate toilets on campus and dormitories, adequacy of facilities for menstrual health needs, knowledge of students on menstrual hygiene.

From the unadjusted multivariate logistic regression, girls aged 18 years and above, students who stay with mothers only during vacation, availability of bins for disposal of pads and availability of separate toilets on campus and in the dormitory were significant predictors of good menstrual hygiene practice. Girls aged 18 years and above were 4.24 times more likely to have good menstrual hygiene practices compared to girls who were 14 years and below (OR = 4.24, $p < 0.05$, 95% CI: 1.19–15.10). Students who stayed with their mothers were 1.87 times more likely to have good menstrual hygiene practices compared to those who stayed with both parents during vacation (OR = 1.87, $p<0.05$, 95% CI: 1.24–2.84). Students in schools where there is availability of bins for disposal of pads were 1.99 times more likely to have good menstrual hygiene practices compared to students in schools where there are no dedicated bins (OR = 1.99, $p<0.05$, 95% CI: 1.40–2.82). Also, girls in schools that have separate toilet facilities on campus and in the dormitories are 1.59 times more likely to adopt good menstrual hygiene practices than those who do not have separate toilet facilities (OR = 1.59, $p<0.05$, 95% CI: 1.01–2.53).

The study further sought to adjust for the various factors. In the adjusted multivariate logistics regression, students who stay with mothers only during vacation, availability of bins for disposal of pads, adequacy of facilities for menstrual needs were significant predictors of good menstrual hygiene practice. In the adjusted model, the age of girls 18 years and above and availability of separate toilets on campus and dormitories were no longer significant.

Controlling for all other factors in the model, students who stay with their mothers only during vacation are 1.88 more likely to be engaged in good menstrual hygiene practices as compared to those who stay with both parents (AOR = 1.88, $p<0.05$, 95% CI: 1.16–3.02). Schools with dedicated bins available for disposal of sanitary pads were twice more likely to adopt good menstrual hygiene practices as compared to those who did not have (AOR = 2.19, $p< 0.05$, 95% CI: 1.424 - 3.392) controlling for all other factors in the model. In the adjusted model, after controlling for all other factors, girls who had adequate facilities for menstrual needs were more likely to adopt hygienic menstrual practices (AOR = 0.60, $p<0.05$, 95% CI: 0.391 - 0.91).

The general regression equation was statistically significant (p<005). Thus, we reject the null hypothesis and conclude that there is a significant relationship between demographic and knowledge factors and menstrual hygiene management practices.

Logistic regression equation

$$Log(ʎ_i) = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \cdots + \beta_n X_n$$

Where $ʎ_i$: Dependent variables

β: Regression coefficients for explanatory variables

X : Explanatory variables

Hypothesis

H$_0$: There is no relationship between the demographic, knowledge factors and menstrual hygiene practices. ie. ($ß_1 = ß_2 = \ldots\ldots\ldots\ldots ß_k = 0$)

H$_a$: There is a relationship between the demographic, knowledge factors and menstrual hygiene practices. ie. ($ß_1 = ß_2 = \ldots\ldots\ldots\ldots ß_k \neq 0$)

Summary

From the multivariate logistic regression, it can be confirmed that girls aged 18 years and above, students who stay with mother only during vacation, availability of bins for disposal of pads and availability of separate toilets on campus and in the dormitory were independent predictors of adoption of good menstrual hygiene practices. In the joint model, it can be confirmed that students who stay with mother only during vacation, availability of bins for disposal of pads, adequacy of facilities for menstrual needs were significant predictors of good menstrual hygiene practice adoption in the presence of other factors.

Table 7: Multivariate Logistic Regression (Unadjusted and Adjusted)

	Unadjusted				Adjusted p-value - 0.006 Pseudo-R2 = 0.074			
	OR	**p-value**	**[95% Confidence Interval)**		**AOR**	**p-value**	**[95% Confidence Interval)**	
Age								
≤ 14 years	1				1			
15-17 years	2.926	0.077	0.888	9.637	2.335	0.209	0.621	8.777
≥ 18 years	4.24	0.026*	1.191	15.102	2.848	0.158	0.666	12.167
Level								
Form 1	1				1			
Form 2	1.28	0.157	0.91	1.802	0.982	0.937	0.62	1.556
Religion								
Islam	1				1			
Christianity	1.444	0.248	0.774	2.693	1.464	0.294	0.718	2.983
Traditional	2.095	0.558	0.177	24.865	3.886	0.334	0.248	60.912
School residency status								
Day	1				1			
Boarding	1.319	0.166	0.891	1.952	1.186	0.47	0.747	1.883
Who student stays with								
Both Parents	1				1			
Mother Only	1.872	0.003*	1.236	2.837	1.875	0.01*	1.164	3.022
Father Only	0.643	0.25	0.303	1.366	0.512	0.131	0.215	1.219
Household without elderly female	0.336	0.197	0.064	1.758	0.131	0.098	0.012	1.46

Household with elderly female	1.121	0.75	0.555	2.264	1.188	0.67	0.538	2.623
Alone	0.841	0.833	0.167	4.225	0.516	0.465	0.088	3.037
Mother's educational level								
No Education	1				1			
Primary	0.947	0.908	0.376	2.383	0.981	0.971	0.342	2.813
JHS	1.062	0.88	0.485	2.324	1.479	0.401	0.594	3.686
SHS	1.048	0.907	0.474	2.317	1.199	0.706	0.467	3.082
Tertiary	0.939	0.88	0.411	2.141	0.912	0.858	0.335	2.484
Technical/Vocational	1.04	0.931	0.428	2.527	1.271	0.673	0.417	3.868
Father's educational level								
No Education	1				1			
Primary	0.5	0.254	0.152	1.645	0.488	0.335	0.113	2.099
JHS	0.687	0.4	0.288	1.644	0.348	0.072	0.11	1.099
SHS	1.051	0.905	0.46	2.402	0.528	0.271	0.169	1.647
Tertiary	1.067	0.878	0.467	2.44	0.556	0.307	0.18	1.716
Technical/Vocational	0.75	0.532	0.305	1.847	0.416	0.165	0.12	1.437
Bins identified for disposal of pads only?								
No	1				1			
Yes	1.99	0.00*	1.404	2.819	2.198	0.00*	1.424	3.392
No	1				1			
Yes	1.065	0.721	0.753	1.506	1.101	0.652	0.726	1.669
Separate toilets on campus and in the dormitory								

No	1				1			
Yes	1.593	0.048*	1.005	2.526	1.651	0.069	0.962	2.834
Adequacy of facilities for menstrual needs								
No	1				1			
Yes	0.717	0.068	0.501	1.025	0.597	0.017*	0.391	0.91
Knowledge level								
Poor	1				1			
Moderate	1.051	0.83	0.667	1.655	0.964	0.893	0.563	1.649
Good	1.138	0.641	0.662	1.956	0.92	0.795	0.488	1.732
Constant					0.319	0.238	0.048	2.127

4.6 Challenges of menstrual hygiene management

Finally, the study sought to determine some of the challenges of menstruation and menstrual hygiene practices among females. Results from Table 8 indicate that some girls still miss school during their menstrual periods as 13.81% reported usually missing school and 16.02% saying they rarely miss school. However, most of them still stay in school during their menstruation period. Even though majority reported that their schools have lockable toilets, 32.53% reported that they do not have lockable toilets to ensure their privacy. Similarly, just a few students reported not having lockable toilets at home (10.89%). As a new phenomenon in most adolescent females and the myths surrounding menstruation, 34.88% of the students reported being ashamed of their menstruation period with a few (18.84%) being teased or harassed by males when they are in their menstrual periods. Most of the students (82.72%) felt that the prices of menstrual management materials, especially the sanitary pads were too expensive to purchase.

Table 8: Menstrual hygiene challenges

	Frequency	Percentage
Missing class during menstruation?		
Usually	75	13.81
Rarely	87	16.02
Never	381	70.17
Do your school toilets have lockable doors for privacy?		
No	176	32.53
Yes	364	67.28
Do home toilets have lockable doors for privacy?		
No	59	10.89
Yes	483	89.11
Have you ever felt ashamed because of your menstruation?		
No	351	65.12
Yes	188	34.88
I have been teased/harassed/provoked by males before due to menstruation		

No	435	81.16
Yes	101	18.84
Do you think sanitary pads are very expensive?		
No	94	17.28
Yes	450	82.72

Source: Fieldwork (2022)

Noting the challenges identified by the respondents especially with the cost of menstrual management materials, the study sought to further ask what should be done about the price of sanitary pads. Majority (190) indicated that taxes placed on sanitary pads by the government should be taken off to lead to reduction in price. 156 students indicated that there should be subsidies on sanitary pads in order to make them affordable while 152 students noted that sanitary pads should be made totally free for females especially adolescents and those in senior high schools. A few (35) had no issues with the current prices of sanitary pads. (Figure 22).

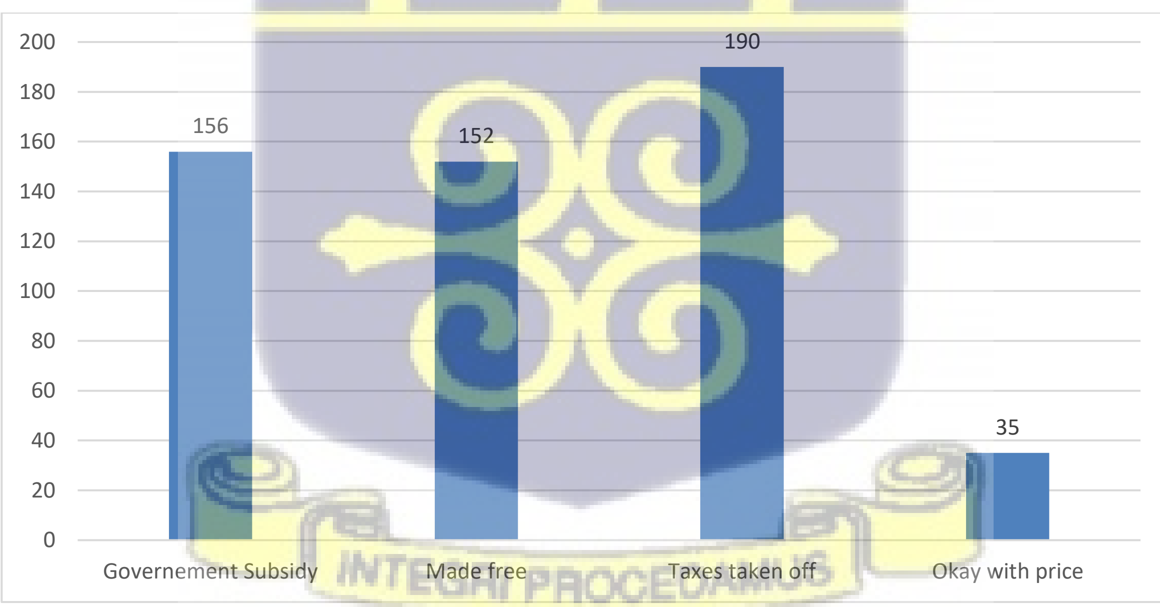

Figure 22: What should be done about the price of sanitary pads?
Source: Fieldwork (2022)

4.7 Discussions

4.7.1 Knowledge of students on menstruation

The importance of knowledge in health promotion cannot be overemphasized. Knowledge generation and sharing has been a key part of health education and a major factor that influences health beliefs and practices. Hence its importance in MHM cannot be downplayed. Overall, most of the female students showed good knowledge (61.22%) on menstruation and its related hygiene practices with less than half having moderate knowledge (21.36%) on menstruation and its associated practices. This was exhibited from the responses to questions asked to elicit knowledge. In the self-assessment, most of the female students indicated they had high knowledge in menstruation and menstrual hygiene with few having moderate and low knowledge. It was obvious from both results that, students perceived themselves to be very knowledgeable.

A similar study in Ethiopia among both preparatory and high school students using a quantitative approach reported that about three-fourths of students had good knowledge about menstruation and menstrual hygiene management (Bulto, 2021). Their findings are similar to the findings of this study. This could be due to the level of students engaged in both studies, the similarity in demographic characteristics and African context.

According to an evidence synthesis report in Africa, most adolescent females had low knowledge about menstruation before they experienced it, with few sources of reliable information (Coast & Lattof, 2018) and these findings were contrary to the findings of this study. Even in cases where they receive information, the information they receive is often inaccurate, surrounded by myths rather than facts. Similarly, in a descriptive cross-sectional study among adolescent schoolgirls in Dhaka City, it was reported that majority of the respondents did not have adequate knowledge about menstruation before the onset of their menarche (Parvin et al., 2016). The findings in this study were partially different because, in this study, most of the girls had already started menstruating and gathered some experiences as mentioned in the evidence synthesis that they usually have low knowledge before experiencing menstruation.

Another cross-sectional study in Ethiopia among adolescent girls also reported that majority of schoolgirls had poor knowledge about menstruation (Belayneh & Mekuriaw, 2019). This was different from the findings of Bulto (2021) which reported good knowledge. This could be due to the difference in location, demographics and years the studies were conducted. It could also be assumed that the recommendations by Belayneh and Mekuriaw (2019) were implemented thus improving the knowledge of schoolgirls on menstruation in later studies by Bulto (2021). Also, the findings of Belayneh and Mekuriaw (2019) are different from the findings in this study. Even though there were few misconceptions and knowledge gaps among some students, the majority showed good knowledge.

In Nepal, a similar study using self-administered structured questionnaires among grade seven and eight students reported that about 67.4% respondents exhibited fair knowledge and 26.4% showed good knowledge on menstrual hygiene management (Yadav et al., 2017). Though similar to this study, it also showed some variations in results. Since 2017, health education campaigns, awareness creation and WASH issues have been on the rise (Yadav et al., 2017). Hence this may account for the difference in results.

Regarding specific knowledge questions, about 95% knew menstruation is a natural shedding of blood on a monthly basis. However, just 7% knew that it was a physiological problem even though the term physiological was explained to respondents. In a study in Nepal, as high as 83% knew menstruation as a physiological process (Yadav et al., 2017). Majority of the respondents adequately knew that menstruation is caused and regulated by hormones, but a few (3.68%)

thought it was a curse by God. Also in the study by Yadav et al. (2017), about 1.1% thought it was a curse from God. In the study by Bulto (2021), 46.2% said it is a physiological process, which was higher than that of this study and 24.1% mentioned it was a curse from God with this misconception was also higher in the Ethiopian study. Most (65.38%) of the students knew the menstrual blood was from the uterus but others (22.28%) said it was from the abdomen. In Ethiopia, those that thought it was from the uterus were 74.7% and 5.4% said the blood was from the bladder or abdomen. Thus, the misconception of the blood coming from the abdomen was higher in this study.

In this study, 92.01% knew that the normal flow of menstruation was two (2) to seven (7) days and 61.78% knew the normal interval between periods to be 20 to 35 days, 14.29 % thought it was less than 20 days, and as much as 20% did not know. Similarly, in Bulto (2021), more students knew the normal duration of flow (89.1%), but few were able to tell the normal interval between periods (42.7%). More than half (55%) knew that menstruation was not a lifelong process but as much as 44.98% thought it was lasting for a lifetime.

Regarding information on menstruation, 90.61% had received information before their menarche with teachers (301) being the highest source of information followed by mothers (236). In Bulto (2021), 94% had received information and mothers were the major source of information as compared to teachers in this study. Most of the students had knowledge about the menstrual hygiene materials. Disposable sanitary pads were the commonly known and used material with few knowing other ones such as reusable pads, tampons and menstrual caps. About 114 students still knew about menstrual cloths but only few used them.

4.7.2 Menstrual Hygiene Practices

Findings from this study showed that about 57% of students are engaged in good menstrual hygiene practices in school and at home with 43% engaged in poor menstrual hygiene practices. Considering the narrow gap between good and poor practices, it can be said that students are still engaged in poor menstrual hygiene practices. A similar study in Ethiopia among both preparatory and high school students using reported different results (Bulto, 2021). In their study, only 34.7% of the students surveyed were engaged in adequate menstrual hygiene practices. In this study, the schools sampled were mostly in peri-urban areas with quite modern facilities with most of the respondents coming from urban areas and spending their vacations there. Hence, it is not surprising that majority are engaged in good practices. However, owing to the amount of information available to such group of students, it is alarming for about 43% of students to be engaged in poor practices.

From this study, comparing MHM at school and at home, it is evident that the best practices are done at home. In school, most girls are involved in disposing of sanitary pads in the toilets and the drains. It was reported that adequate MHM among most girls is difficult, and some struggle with keeping up to good practices. As seen in this study, the review also reported that managing menstrual hygiene is particularly difficult at school (Coast & Lattof, 2018).

Also, in Nepal, less than half (40%) of the respondents were engaged in good menstrual hygiene practices which is lower than that found in this study. In a study in Ethiopia among high school adolescents, the prevalence of poor menstrual hygiene management practice was 53.6%. This is higher than the figure in this study although both studies are among high school students. However, in the Ethiopian study, the higher rate of poor practices could be due to the employment of observational checklists as compared to this study (Shallo et al., 2020).

In Bangladesh, a study that adopted a mixed method approach among adolescent girls aged 13 to 18 years reported that only 11.90% of the respondents practiced good menstrual hygiene and the rest maintained moderate to poor practice level and this finding was far from that reached by the study. This might be because most of the respondents were refugees, hence lacked access to basic WASH facilities since in emergency situations, menstrual hygiene is not given much attention (Pandit et al., 2022). 97.44% respondents in this study indicated that they use disposable sanitary pads and just a few used the menstrual cloth, reusable sanitary pads, tampons and menstrual cups. In Ghana, the most widely available option in the urban area is the disposable pads, hence the high number of utilization. Most adolescents in the urban areas are not familiar with other options even though they have heard of them and the study revealed that some were willing to try new options if they had the choice, a similar study done in Ghana corroborated these findings. On the other hand, another study on Ghana reported that 58.6% used disposable pads, 30.5% used cloth with the rest using cotton and tissue (Asumah et al., 2022).

Evidently, respondents had diverse reasons linked to the menstrual product preference, with a quarter of the respondents indicating that their choice of products is based on its comfort, 21% on availability, 18% on protection from stains and 17% on cost or affordability. The rest were based on disposal (8%) and finally durability (6%). These respondents are students in second cycle institutions and students are not allowed to leave school premises unless school is over or during emergencies, hence, this explains the reason for their choice because if they are not comfortable in a particular absorbent or the absorbent is not easily accessible and affordable it might be difficult for them to switch absorbent let alone concentrate in class. Fear of stains is another reason why students chose a particular menstrual absorbent. Menstruation has been faced with shaming and secrecy, hence females usually want to make sure they do not stain themselves with their menstrual blood to avoid the stigmatization associated with it. Pandit et al. (2022) posit that menstruating women usually experience stigmatization while engaging in their routine activities.

Hygiene during menstruation is very essential to the wellbeing of females and emphasis is usually placed on the self-care practices employed by females to manage their menstruation. According to UNICEF (2008), females must change their sanitary absorbent 3 or more times a day.

4.7.3 Factors influencing menstrual hygiene practices

In most contexts, especially at home and school, MHM is influenced by several factors. These are either within or out of control of the student. In this study, it was found that different factors either independently or jointly influence the adoption of good menstrual hygiene practices.

In this study, girls aged 18 years and above, who stay with their mothers only during vacation, availability of bins for disposal of pads and availability of separate toilets on campus and in the dormitory adequacy of facilities for menstrual needs were significant predictors of good menstrual hygiene practice adoption in the presence of other factors. Thus, older students are assumed to practice better menstrual hygiene as compared to the younger ones. The availability of different conditions such as toilets that ensure privacy and adequate sanitary pad disposal facilities significantly influence their practices.

In a similar study among adolescent school girls, it was reported that urban residence (AOR=2.62, 95% CI: 1.53-4.48), information being received from mothers (AOR=2.17, 95% CI: 1.18-3.96) and teachers (AOR=5.09, 95% CI: 2.67-9.67), school toilets with inside locks (AOR=2.82, 95% CI: 1.67-4.76), and having good overall knowledge about menstruation (AOR=1.94, 95% CI: 1.07-3.52) were significantly associated with good menstrual hygiene practices (Bulto, 2021).

In a similar study among secondary school girls in Eastern Ethiopia, it was found that the place of residence, educational status of mothers and knowledge status were independently influencing menstrual hygiene management practices (Mohammed, 2020). Findings of this study are different from that of Mohammed (2020). Considering the sociodemographic characteristics of the study in Ethiopia, there are vast differences as compared to this study. This could be a contributory factor to the differences.

An exploratory qualitative study using focus group discussion in Zambia revealed that poor menstrual hygiene practices among adolescent girls were linked to lack of knowledge, culture and tradition, and socio-economic and environmental constraints they face (Lahme et al., 2018). It further explained that the community setting does not provide the needed cultural and environmental settings for girls to adequately manage their menstrual periods thus suggested a and a community setting that would create a supportive environment for girls to manage their periods.

In a survey among 7th and 8th grade adolescent girls in Indonesia with a sample of 82 students, it was shown that family support and knowledge about menstrual hygiene practices are factors related to menstrual hygiene practice with knowledge being the most influential factor (Afriyani & Salafas, 2020). Although knowledge was not a significant factor in this study, the family support is highly related to respondents receiving care from their mothers which is a significant factor in this study. It is apparent that girls who receive support especially from family members, precisely mothers tend to develop better menstrual hygiene practices. Also, it is obvious that students had adequate knowledge on MHM however, the absence of adequate WASH facilities were contributory since they could not adequately practice all they know.

In an Ethiopian study among adolescent students to assess factors influencing menstrual hygiene practices, it was found that age of females, frequency of discussion, source of information about menstruation, lack of information about safe MHM and lack of sufficient WASH facilities were significant predictors of adequate MHM (Shallo et al., 2020). In the findings of this study it was found that advanced female age and availability of adequate WASH facilities influenced menstrual hygiene practices.

4.7.4 Challenges in Menstrual Hygiene Management

The study found that the price of sanitary pads, inappropriateness of WASH facilities in schools to ensure adequate MHM and absenteeism were challenges hampering adequate menstrual hygiene practices among senior high school students. In a similar study in Ghana among deaf adolescents in schools, it was found that inadequate access to sanitary pads, inappropriate school WASH facilities, health related problems, negative attitude of male colleagues and academic related challenges were hampering menstrual hygiene management (Mprah, Sackey & Dourinaah, 2022). Findings in the study corroborate the findings of this study which include access to sanitary pads which has been linked to the price and poor WASH facilities. In the study by Mprah, Sackey and Dourinaah (2022), although some males exhibit negative attitudes toward females during menstruation, it was not a challenge to majority of the respondents.

The study found that less than 30% of students miss school during their menstrual period with different frequencies of absenteeism. Contrary to findings in this study, a study in Northeast Ethiopia among adolescent girls using a mixed method approach reported that more than 50% of girls absent themselves from school during their menstrual period (Tegegne & Sisay, 2014). This finding could be due to the year of the study since several programmes to improve access to sanitary materials and reduce absenteeism have been developed and implemented.

In a multi-method study in Ghana, involving both males and females, it was reported that cost of menstrual care products, misconceptions and myths, and lack of adequate WASH material and facilities were barriers to menstrual hygiene management practices (Mohammed & Larsen-Reindorf, 2020). Their findings are similar to results of this study considering similar contexts.

However, the target population was junior high students as compared to senior high school students in this study. Despite the differences, it could be said that the challenges are similar irrespective of the level of the school.

In a review article on MHM challenges faced by girls in developing countries, it was revealed that lack of privacy in houses and schools are major challenges (Kaur et al., 2018). This is in line with findings of this study.

In an exploratory qualitative study in Zambia which included both girls and boys, it was reported that challenges to MHMP include inadequate provision of sanitary materials, water, hygiene and sanitation facilities (WASH) in schools such as absence of locks on toilets, water and soap and bad odor (Chinyama et al., 2019). These findings are not different from the findings of this study. It goes to stress how challenging the absence of WASH facilities are to menstrual hygiene management practices. It is evident from this study and other studies across the world that adolescent girls in school face common challenges with respect to the MHM (Trinies et al.,2015).

CHAPTER FIVE

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

5.1 Introduction

This chapter presents the concluding remarks from the study. The chapter is subdivided into three major sections. The first section presents the summary of the key findings of the study while the second section presents its conclusions. The recommendations and suggestions for further research are given in the third section of the text.

5.2 Summary

The primary aim of the study was to assess the menstrual hygiene practices among female students in senior high schools in Ghana. This was done through specific objectives which include assessing the knowledge of students on menstrual hygiene, assessing student's menstrual hygiene practices, examining the factors that influence their menstrual hygiene practices, and challenges they face during menstruation.

The study employed a cross-sectional research design using a quantitative approach of data collection. Data was collected from female students in 2 senior high schools in the New Juaben Municipality in the Eastern region of Ghana using simple random sampling technique. A total of 557 respondents were sampled for the study. Data was initially analyzed descriptively, and a logistic regression was done to determine the factors that significantly influence menstrual hygiene practices. Data were presented in tables, pie and bar charts.

5.2.1 Knowledge of students on menstruation

Overall, students exhibited good knowledge (61.22%) on menstruation and its related hygiene practices with less than half having moderate knowledge (21.36%). 17.41% of students exhibited poor knowledge on menstruation. However, in a self-assessment, 179 students perceived themselves to be very highly knowledgeable, 200 students perceived themselves to be highly knowledgeable with few students indicating they had low and very low knowledge. 529 students knew menstruation was a natural shedding of blood on a monthly basis with only 43 knowing it was a physiological process. 87% knew that menstruation was regulated by hormones and only 65.38% knew menstrual blood was from the uterus. 92% were able to tell the normal duration of menstrual flow with only 61.78% knowing the normal interval between two cycles. About 45% of students thought menstruation was a lifelong process. In all, 90.61% were told about menstruation before their menarche. Majority of the information was from teachers (301), mothers (236) and friends (210).

5.2.2 Menstrual hygiene practices

Overall, about 57% had good menstrual hygiene practices while 43% had poor practices. Results indicate that about 98% of students use disposable pads with only 0.37% using napkins and clothes. On asking their preference, a few more students would prefer to use tampons if given the choice. Most of the reasons for their choice were comfort (25%), availability (21%), ability to prevent stains (18%) and easy disposal (17%). Most of the students changed their sanitary pads twice (255) and three or more times a day (254). At home, most students burn their sanitary pads, while at school they often drop them in the bin or in the toilet. 95% of the students wrap their sanitary pads before disposal with 99% of them taking their bath during menstruation. 523 students indicated they bath at least twice a day during their menstrual periods. 99% of them cleaned their genital areas during menstruation with about 324 using only water and 114 using water and antiseptic while only 89 use water and soap. 239 respondents resorted to rest as a remedy to their periods while 158 take various medications.

5.2.3 Factors influencing menstrual hygiene practices.

From the multivariate logistic regression, results show that girls aged 18 years and above (OR = 4.24, $p < 0.05$, 95% CI: 1.19–15.10), students who stay with mothers only during vacation (OR = 1.87, $p<0.05$, 95% CI: 1.24–2.84), availability of bins for disposal of pads (OR = 1.99, $p<0.05$, 95% CI: 1.40–2.82) and availability of separate toilets on campus and in the dormitory (OR = 1.59, $p<0.05$, 95% CI: 1.01–2.53) were independent predictors of good menstrual hygiene practices. Controlling for all other factors, students who stay with mothers only during vacation (AOR = 1.88, $p<0.05$, 95% CI: 1.16–3.02), availability of bins for disposal of pads (AOR = 2.19, $p< 0.05$, 95% CI: 1.424 - 3.392), adequacy of facilities for menstrual needs (AOR = 0.60, $p<0.05$, 95% CI: 0.391 - 0.91) were significant predictors of good menstrual hygiene practices.

5.2.4 Menstrual Hygiene Challenges

From the results, the majority (67.28%) of respondents indicated that their schools did not have lockable toilets to ensure adequate privacy indicating inadequacies in WASH facilities, about 30% missed class during menstrual periods, 18% go through teasing and harassment from male counterparts. About 83% of respondents indicated that sanitary pads were very expensive and was a challenge to maintaining hygienic practices.

5.3 Conclusions

It can be concluded that though majority of students were knowledgeable about basic menstruation and menstruation hygiene, a lot of students lacked knowledge on the technicalities of menstruation and menstrual hygiene. This was shown from the number of students who had poor knowledge.

Secondly, menstrual hygiene practices among students varied. It can be concluded that though students exhibited good practices in some areas, the percentage who exhibited poor practices were still high. Also, these practices are largely being influenced by the availability of a mother figure to share experiences and guide adolescents, and conducive environments at schools and home to foster good practices.

Thirdly, the study concludes that the price of sanitary pads and inappropriate places of WASH facilities at schools are challenges hampering adequate menstrual hygiene practices among senior high school students.

5.4 Recommendations

Following the conclusions made, the study makes the following recommendations;

1. The study found that students are still deficient in knowledge about menstruation and menstrual hygiene management practices with some misconceptions on menstruation.
    a) Hence, it is important that stakeholders in the educational sector especially the Ministry of Education, the Ministry of Health, and NGOs develop and implement holistic and comprehensive health education programmes to educate students on issues relating to menstruation in order to improve knowledge and dispel all misconceptions.
    b) To improve knowledge, reproductive health clubs already existing in schools should be made active with new clubs developed in schools and communities that do not have any. Also, active social media platforms should be developed for students to continuously engage themselves even on vacation.
2. A significant number of students are still engaging in poor menstrual hygiene practices even though they have knowledge on them. This is due to the absence of a conducive environment and facilities to facilitate adequate menstrual hygiene practice. Thus, it is recommended that all heads of educational units make adequate preparations to create conducive environments for female students and improve upon facilities to ensure privacy.

3. Considering the factors that influence good menstrual hygiene practices. It is essential that educational programmes to improve knowledge and menstrual hygiene practices are largely designed to target girls under the age of 18 years. Also, Schools should construct clean and private sanitary facilities including water, dedicated dustbins for the disposal of sanitary materials and promote good disposal practices.
4. Finally, it is shown that the price of sanitary materials, especially sanitary pads, hampers the use of recommended materials. It is recommended that the government develops a programme to make sanitary pads available to students for free, remove taxes from sanitary pad sales or provide subsidiaries for the purchase of sanitary pads by adolescent girls.

5.5 Implications for research, policy and practice

For research, the study provides data to inform further research into MHM. It is important for further research to look into how schools and other family members at home support adolescent girls during menstruations. The study also serves as data to monitor and evaluate the progress of current programmes to improve menstrual hygiene knowledge and practice.

There is the need for educational and health policies that inculcate menstruation hygiene into the curriculum of schools and development of policies on extra-curricular activities to improve menstrual hygiene. The government needs to develop policies to support access to MHM materials.

In practice, WASH facilities should be improved. Students, parents, teachers and heads of educational institutions need to be provided with up-to-date information on good menstrual hygiene management practices. The guidelines developed by the WHO and UNICEF need to be adequately practiced by all stakeholders.

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APPENDICES

APPENDIX ONE: Sample Consent Form for Students

CONSENT FORMS FOR STUDENTS

Background information

Title of study	Menstrual Hygiene Management
Researcher	Mary Adebi Nyamekye

General Information about Study

The purpose of this study is to find out how menstruation is managed among students in senior high schools, as well as their knowledge, practices and challenges towards menstrual hygiene. The study is expected to take 15 minutes of your time for you to fill the instrument provided.

Benefits/Risks of the study

There will be no personal gains in participating in this study. However, it is expected that the findings of this study will contribute to improving menstrual hygiene management. The study might ask questions that may be quite sensitive but the study in no way poses harm to respondents.

Confidentiality

Your responses will be coded uniquely and any other information provided will be kept under lock and key to prevent access to third parties. Information kept on laptops will also be password protected. Hence, information provided will be used solely for the purpose of research and there will be no traces of your identity since the questionnaire does not require personal identification details like your name.

Compensation

There will be no compensation in kind or in cash for participants either before or after they have finished filling the questionnaire.

Withdrawal from Study

Participation is voluntary and you have the right to withdraw at any time without being questioned and at no cost. Also withdrawing from the study will have no effect on you.

Contact for Additional Information

For further information, please contact Mary Adebi Nyamekye on 0542793081(researcher) or

Dr. Nana Nimo Appiah-Agyekum via email nnappiah-agyekum@ug.edu.gh (supervisor) and Dr. Francis Anderson Adzei via email fadzei@ug.edu.gh (supervisor).

Participant Agreement

"I have read or have had someone read all of the above, asked questions, received answers regarding participation in this study, and am willing to give consent to participate in this study. I will not have waived any of my rights by signing this consent form."

____

Name of Participant

________________________________ ___________________

Signature or mark of Participant Date

APPENDIX TWO: Sample Consent Form for Teachers/Guardians

CONSENT FORMS FOR TEACHERS/GUARDIANS

Background information

Title of study	**MENSTRUAL HYGIENE MANAGEMENT AMONG STUDENTS IN THE NEW JUABEN NORTH MUNICIPALITY**
Researcher	**MARY ADEBI NYAMEKYE**

General Information about Study

The purpose of this study is to find out how menstruation is managed among students in senior high schools, as well as their knowledge, practices and challenges towards menstrual hygiene. The study is expected to take 15 minutes of your time for you to fill the instrument provided.

Benefits/Risks of the study

There will be no personal gains in participating in this study. However, it is expected that the findings of this study will contribute to improving menstrual hygiene management. The study might ask questions that may be quite sensitive but the study in no way poses harm to respondents.

Confidentiality

Responses will be coded uniquely and any other information provided will be kept under lock and key to prevent access to third parties. Information kept on laptops will also be password protected. Hence, information provided will be used solely for the purpose of research and there will be no traces of your identity since the questionnaire does not require personal identification details like names.

Compensation

There will be no compensation in kind or in cash for participants either before or after they have finished filling the questionnaire.

Withdrawal from Study

Participation is voluntary and respondents have the right to withdraw at any time without being questioned and at no cost. Also withdrawing from the study will have no effect on you.

Contact for Additional Information

For further information, please contact Mary Adebi Nyamekye on 0542793081(researcher) or

Dr. Nana Nimo Appiah-Agyekum via email nnappiah-agyekum@ug.edu.gh (supervisor) and Dr. Francis Anderson Adzei via email fadzei@ug.edu.gh (supervisor).

Participant Agreement "I have read or have had someone read all of the above, asked questions, received answers regarding participation in this study, and I am willing to give consent to my students to participate in this study. I will not have waived any of my rights by signing this consent form."

____

Name of Guardian

______________________________ ________________

Signature or mark of Participant Date

APPENDIX THREE: Questionnaire

Menstrual Hygiene Management (MHM)

Please respond to the questionnaire by ticking or filling the blank spaces where necessary.

A. SOCIO-DEMOGRAPHIC CHARACTERISTICS

Q1. Age ……………

Q2. Your region of residence (eg. Oti, Savannah, Central etc.) ……………………

Q3.Level? (Tick one)
☐ form 1
☐ form 2

Q4.What is your **RELIGION**:
☐ Islam
☐ Christianity
☐ Traditional

Q5. Accommodation
☐ Day
☐ Boarder

Q6. With whom do you usually **STAY with during vacation**? (Tick one)
☐Both parents (Mother and father)
☐Mother only
☐Father only
☐Households without any elder female member(s)
☐ Households with elder female member(s) other than mother
☐Alone

Q7. What is your **MOTHER'S EDUCATIONAL LEVEL**? (alive or deceased)
☐ No Education
☐ Primary
☐ Junior Secondary
☐ Senior Secondary
☐ Tertiary
☐ Technical/Vocational

Q8. What is your **FATHER'S EDUCATIONAL LEVEL**? (alive or deceased)
☐ No Education
☐ Primary
☐ Junior Secondary
☐ Senior Secondary
☐ Tertiary
☐ Technical/Vocational

Q9. Have you started menstruating
☐ Yes
☐ No

(if answer is no for Q9, skip to Q13)

Q10. At what age did you experience your first menstruation.
…………………………………………………….

Q11. Where did you have your first menstruation
☐ In school when I was in primary
☐ In school when I was in JHS
☐ In school during SHS
☐At home

Q12. Who was there to guide you
☐ Father ☐ Mother
☐ Teacher ☐ Friends
☐ Older sibling ☐ Other relatives
☐ No one

B. KNOWLEDGE

Q13. What is menstruation? (tick all that applies)
☐A disease on monthly basis
☐Natural shedding of blood on monthly basis
☐Type of curse received by women
☐Is a physiological process
☐I don't know
☐None of them

Q14. What is the cause of menstruation?
☐Curse of God
☐Caused by diseases
☐Hormones
☐Don't know

Q15. Which organ does the menstrual blood come from
☐Uterus (Womb)
☐Bladder
☐Abdomen
☐Don't know

Q16. What is the duration of normal menstruation?
☐less than 2 days
☐2 – 7 days
☐ greater than 7 days
☐ I don't know

Q17. What is the interval between two menstrual cycles? (in days)
☐ less than 20 days
☐ 20 – 35 days
☐ greater than 35 days
☐ I don't know

Q18. Did anyone tell you about menstruation before your first menstruation occurred?
☐ Yes
☐ No
☐ I don't remember

Q19. From whom did you get information regarding menstruation (tick all that applies)
☐Father ☐Mother
☐Teacher ☐Friends
☐Sisters ☐television
☐Internet
☐Health professional

Q20. Menstruation is a lifelong process
☐Yes
☐No

Q21. Which of these menstrual products are you aware of? (tick all that applies)
☐Disposable pad ☐Reusable pad
☐ Tampon ☐Menstrual cloth
☐Menstrual cup
☐Others……………………….

Q22. Which of these do you use during your period/or have ever used?
☐Disposable pad ☐Reusable pad
☐Tampon ☐Menstrual cloth
☐Menstrual cup
Others……………………….

Q23. Generally, how will you rate your knowledge on menstrual hygiene management (MHM)
☐Very high
☐High
☐ Moderate
☐Low
☐Very low

C. PRACTICE

Q24. What is the main absorbent material you use during period/menstruation? (Tick **only one**)
☐ Disposable sanitary pad ☐Cotton
☐ Napkin/cloth or towel ☐Tissue paper
☐Reusable sanitary pad ☐ Tampon
☐Menstrual cup ☐Other …………….

Q25. Which one would you prefer the most if given the choice? (Tick **only one** choice)
☐ Disposable sanitary pad ☐Cotton
☐ Napkin/cloth or towel ☐Tissue paper
☐Reusable sanitary pad ☐ Tampon
☐Menstrual cup ☐Other …………….

Q26. Why your choice in Q32 (Tick **all that applies**)
☐ Easily available ☐ Easily disposable
☐ Affordable ☐ It is comfortable
☐ Last longer ☐ No fear of stains
☐Other(specify)
……………………………………..

Q27. How many times do you change your sanitary in a day when on your period
☐ once ☐ twice
☐ three or more

Q28. Where/how do you dispose your pads when in school?
☐drop it in a bin
☐ drop it in the drain (gutter)
☐drop it in the toilet /latrine / KVIP
☐burn it
☐ bury it

Q29. Where/how do you dispose your pads when at home?
☐drop it in a bin
☐drop it in the drain (gutter)
☐drop it in the toilet /latrine / KVIP
☐burn it
☐bury it

Q30. Do you wrap your sanitary before disposing it?
☐Yes
☐No

Q31. Do you take your bath during menstruation?
☐Yes
☐No

Q32. If yes, how often?
☐once daily
☐twice daily
☐I start from the second day

Q33. Do you clean genital area during menstruation?
☐Yes
☐No

Q34. If Yes, with what?
☐water and soap
☐only with water
☐only towels
☐ water with antiseptic

Q35. What remedies do you take during menstruation?
☐ medication
☐Isolation
☐Prayers
☐thoroughly involve in activities
☐take rest

D. BARRIERS

Q36. Do you miss classes during menstruation?
☐Usually
☐Rarely
☐Never

Q37. Does your school toilets have bins identified for disposal of pads only?
☐ Yes
☐No

Q38. Does your school toilets have lockable doors for privacy?
☐ Yes
☐No

Q39. Does home toilets have lockable doors for privacy?
☐ Yes
☐ No

Q40. Does school toilets have water for MH
☐Yes
☐No

Q41. Do you have **separate toilets** on campus (school compound) and in the dormitory?
☐Yes
☐No

Q42. Does your school have adequate facilities that help you achieve your menstrual needs?
☐ Yes
☐ No

Q43. Have you ever felt ashamed because of your menstruation?
☐Yes
☐No

Q44. I have been teased/harassed/provoked by males before due to menstruation
☐ Yes
☐ No

Q45. Do you think sanitary pads are very expensive?
☐Yes ☐No

Q46. What do you think should be done about the price of sanitary pads?
☐ Government should subsidize the prices
☐ It should be made free
☐ The taxes on it should be taken off
☐ I am okay with the prices of the sanitary pads

THANK YOU FOR PARTICIPATING!!!

APPENDIX FOUR: Letter of Introduction to Omess

UNIVERSITY OF GHANA
BUSINESS SCHOOL
DEPARTMENT OF PUBLIC ADMINISTRATION
AND HEALTH SERVICES MANAGEMENT

UGBS
University of Ghana Business School

Ref. No.: PAHS/27

20th September, 2022

The Headteacher
Oyoko Methodist S.H.S.
Oyoko - Koforidua.

Dear Sir/Madam,

LETTER OF INTRODUCTION
MARY ADEBI NYAMEKYE

I write to introduce the above student of the Department of Public Administration and Health Services Management of the University of Ghana Business School. Miss Nyamekye is an MPhil. Health Services Management degree student who is conducting a study on **"Menstrual Hygiene Management among SHS Students in Ghana"** for her thesis.

As part of the study, she would require your permission and support in gathering data which will be used purely for academic purposes.

I would be most grateful if she is given support for her data collection.

Thank you.

Yours faithfully,

Nana Nimo Appiah-Agyekum [PHD]
Senior Lecturer/ Academic Supervisor

COLLEGE OF HUMANITIES
P. O. Box LG 78, Legon, Accra, Ghana
Telephone: +233 303 963 735 Email: nnappiah -agyekum@ug.edu.gh Website: www.ug.edu.gh

APPENDIX FIVE: Letter of Introduction to Ghanass

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AND HEALTH SERVICES MANAGEMENT

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20th September, 2022

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