UNIVERSITY FOR DEVELOPMENT STUDIES, TAMALE

EFFECTS OF MENSTRUAL HYGIENE MANAGEMENT ON ACADEMIC PERFORMANCE OF JUNIOR HIGH SCHOOL GIRLS IN THE TAMALE METROPOLIS

NUHU ALIMATU SADIA

THESIS SUBMITTED TO THE DEPARTMENT OF SOCIAL AND BEHAVIOURAL CHANGE, SCHOOL OF PUBLIC HEALTH, UNIVERSITY FOR DEVELOPMENT STUDIES IN PARTIAL FULFILMENT OF THE REQUIREMENTS FOR THE AWARD OFA DEGREE OF MASTER OF PHILOSOPHY IN COMMUNITY HEALTH AND DEVELOPMENT.

MARCH, 2022

UNIVERSITY FOR DEVELOPMENT STUDIES, TAMALE

EFFECTS OF MENSTRUAL HYGIENE MANAGEMENT ON ACADEMIC PERFORMANCE OF JUNIOR HIGH SCHOOL GIRLS IN THE TAMALE METROPOLIS

BY

NUHU ALIMATU SADIA [BSc. HEALTH SCIENCE EDUCATION]

UDS/CHD/0025/19

THESIS SUBMITTED TO THE DEPARTMENT OF SOCIAL AND BEHAVIOURAL CHANGE, SCHOOL OF PUBLIC HEALTH, UNIVERSITY FOR DEVELOPMENT STUDIES IN PARTIAL FULFILMENT OF THE REQUIREMENTS FOR THE AWARD OF A DEGREE OF MASTER OF PHILOSOPHY IN COMMUNITY HEALTH AND DEVELOPMENT.

MARCH, 2022

DECLARATIONS

Student's Declaration

I hereby declare that, except for references to other people's work which have been duly acknowledged, this thesis is the result of my original work. It contains no materials previously presented by another person which has been accepted for the award of any degree elsewhere.

NAME: Nuhu Alimatu Sadia(Mrs.)

SIGNATURE:..... DATE: 16/08/2022.....

Supervisor's Declaration

I declare that the preparation and presentation of the dissertation was supervised in accordance with the guidelines on supervision of dissertation laid down by the University for Development Studies.

NAME OF SUPERVISOR: Prof. Shamsu-Deen Ziblim

SIGNATURE:..... DATE:...16/08/2022...

i

DEDICATION

I dedicate this work to Almighty Allah, my lovely husband and to my children.

ACKNOWLEDGEMENTS

First of all, I wish to thank the Almighty Allah for His love, guidance and protection, throughout the program. I would like to express my profound gratitude and appreciation to my supervisor Prof. Shamsu-Deen Ziblim for his support, patience, guidance, helpful suggestions and constant reminders throughout the duration of this study, without his support and guidance this study would not have been successfully. I am equally grateful to the education office of Tamale metropolis for their assistance and support during the data collection process. Also, my special thanks to the Dean, Head of Department, Lectures and the entire staff of the Department of Social and behavioral change for their guidance and support. I wish to acknowledge the support and encouragement from my family throughout this journey. Finally, I would like to extend my special thanks to all my friends and classmates for their support in making this work complete.

ABSTRACT

Menstruation is a default physiological and biological aspect of females at their reproductive age. Menstruation and girl child academic performance is a public health issue in developing countries including Ghana. The relationship between menstruation and the academic performance of girls is very important and needs to be addressed in detail. This study therefore sought to investigate the effects of menstrual hygiene on the academic performance of Junior high school girls in the Tamale metropolis.

The study used a school based cross sectional study with the mixed method approach. A total of 388 and 44 girls were recruited for quantitative and qualitative data. The quantitative and qualitative data were analyzed using SPSS and thematic content analysis respectively. p value less than 0.05 was pegged as the significant level.

Majority of the respondents (93.8%) have heard about menstruation through the classroom (56.7%), friends (32.7%) and the media (10.7%). overall, 86.6% of girls had good knowledge about menstruation. The study established significant association between knowledge about menstruation and form/class ($p<0.001$) and Religion ($p=0.03$). Nearly 10.0% of adolescent girls absent themselves during menses. The participants indicated that during menstruation they are unable to participate in curriculum and extra curriculum activities. The male counterparts laugh at them and call them names. The fear of being embarrassed by male counterparts and teachers, some girls prefer to stay home for few until the bleeding reduces.

In all, level of knowledge about menstruation is high which might have translated into higher level of effective MHM. However, the school environment, the taboos, the misconception and economic factors have been identified to be a great setback to the girl child education. From the forgoing, the Ministry of Education together with its agency (Ghana Education service) should adopt the menstrual hygiene practices guidelines documented by the UNICEF and WHO to enable adolescent girls practice good MHM in schools.

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

LIST OF ACRONYMS

CBD- Central Business District

FGD - Focus Group Discussion

FSH- Follicle Stimulating Hormone

LH- Luteinizing Hormone

GnRH- Gonadotropins Releasing Hormone

TSS- Toxic Shock Syndrome

GPA- Grade Point Average

GES- Ghana Education Service

GSS - Ghana Statistical Service

HIV/AIDS -Human Immunodeficiency Virus/Acquired Immunodeficiency Syndrome

JHS- Junior High School

LMIC- low- and middle-income countries

MDG- millennium development goals

MHM - Menstrual Hygiene Management

MoH - Ministry of Health

NGO- Non-Governmental Organization.

SDG - Sustainable Development Goals

SPSS- Statistical Package for Social Sciences

STD- Sexually Transmitted Diseases

STI-Sexually Transmitted Infections

TMA-Tamale Metropolitan Assembly

TCA- Thematic Context Analysis

UNICEF - United Nations International Children's Emergency Fund

WASH- Water and Sanitation Hygiene

WHO - World Health Organization

CHAPTERONE

INTRODUCTION

1.1 Background of this study

Menstruation is a physiological process that females go through when they reach reproductive age (Belayneh, 2019). Menarche (the beginning of menstruation) is one of the most significant changes that females experience during their adolescent years. Menarche, or the beginning of the reproductive period of a woman's life, is a significant biological milestone in her life. The typical age of menarche is between the ages of 12 and 13, and it is very stable among populations (Davis, 2018).

Menstruation Hygiene Management (MHM) refers to practical strategies for managing and coping with periods on monthly bases. MHM refers to the ways women keep themselves clean and healthy during their period and how they get, use and dispose of menstrual materials (Abdel, 2005). Unfortunately, due to lack of adequate knowledge at this age on menstruation preparedness and management or due to embarrassment and shyness the situation sometimes gets unfortunate for many girls (Kaur, 2018). Women and girls in developing countries usually face some key challenges in managing their menstruation and its related aspects (Davis, 2018).

Menstrual hygiene (MH) can be said to be the specific hygiene practices and healthy practices required of girls and women during the period of menstruation, this includes, the knowledge, tools and facilities necessary to manage menstruation effectively and as privately as one prefers. Good menstrual health has ramifications for overall health,

education, dignity, and gender equality (Maria, 2018). Lack of adequate knowledge, guidance, and societal support, male-dominated decision-makers, an ongoing gender inequality debate, and tribal taboos around menstruation, on the other hand, lead to girls in many low- and middle-income countries (LMIC) viewing menstruation as something embarrassing that should be kept private (Wall L,2016). According to the journal of clinical diagnostic research (2011), the primary sources of information about menstruation and associated ideas to the adolescent girl are moms, the media, classmates, teachers, and other relatives.

As a result, good MH is unquestionably important for the health, education, and dignity of girls and women. Our educational system plays a critical part in a child's growth and development by preparing them to adapt to the different obstacles that they confront on a daily basis (Kaur et al, 2018). However, it mostly ignores concerns around menstruation and menstrual hygiene habits, seeing them as a personal topic for women that should be discussed at home. The home, on the other hand, ties the problem to cultural norms and timidity, and so avoids discussing it.

This has caused many girls to absent themselves from school, or exempt themselves from some school activities during menstruation Sex and menstruation related education is often exempted from the school curriculum which impacts the student’s life one way or the other. They learn about puberty, sexuality, menstruation, and other physical changes via books, peers, the internet, and other dubious sources that may be incomplete or wrong. Teasing with unpleasant names is frequent in schools due to a lack of precise understanding and social inclusion. Because it is difficult for a female student to live in this atmosphere during menstruation, many prefer to skip school.

Furthermore, many male and female teachers are hesitant or unwilling to discuss menstruation and menstrual hygiene concerns with their pupils. In some schools, female instructors are almost non-existent. Some professors would purposefully leave such issues off the curriculum in order to avoid having an open debate in class or to avoid answering queries from students during such courses (Lawan et al, 2010). Because of the hostile climate and conditions in schools, some girls are afraid to answer questions in class for fear of leaking when they stand up, and they are also afraid to write or come to the blackboard for fear of a menstruation accident or blood stains on their clothes being seen by others. In other reported cases, parents do not allow girls to go to schools upon reaching puberty with the fear of sexual harassment by boys, male teachers and other male workers in the schools (Kaur et al, 2018).

In addition, a lack of a suitable, clean, functioning, and private WASH facility, fear of blood loss, limited access to sanitary tools and supplies, and improper responses from other students and instructors have all been linked to poor menstrual hygiene (Davis, 2018). This can make teenage females more vulnerable to mental, emotional, and physical difficulties (Belayneh, 2019). These circumstances impede girls' everyday academic activities and, as a result, their academic performance in the long term. Girls' tension and pain during menstruation also contribute to their lack of attention and engagement in class and school amenities (Davis, 2018). Poor academic performance, school dropout, and unmet educational goals are the results of these regular bouts of reduced involvement and absence (Omindawre et al, 2018). It's possible that this will have long-term implications.

In 2016, researchers looked at the influence of menstrual hygiene programs on educational and psychological outcomes (Maria, 2018). According to multiple studies done in Sub-Saharan Africa, distributing menstruation pads alone did not result in a substantial reduction in school absenteeism, but adding puberty-related instruction to it resulted in improved school attendance (Singh, 2006).In a research in Northeast Ethiopia, schoolgirls who did not use sanitary napkins were up to 5.37 times more likely to miss school (Maria, 2018).

Fear of leaking, a shortage of sanitary pads, unsuitable underwear, and a private location to change in school were among the leading causes of absence (UNICEF, 2015). Teasing by guys, including some instructors and other girls, was also reported by girls in other studies (Maria, 2018). The probability of being seen by others in a blood-stained clothes, which commonly results from having the first menses at school without any previous preparation, was the first reason given for dropouts linked with menstruation (Maria, 2018).

In a research done in Ethiopia, Uganda, and Kenya, majority of the responding students and teachers reported problems concentrating and decreased performance in class as a result of their discomfort, humiliation, worry, and distraction (Maria, 2018).Most previous research focused solely on school attendance, neglecting to examine aspects such as class attentiveness, curriculum and extracurricular engagement, academic performance, and accomplishment throughout the menstrual cycle (Maria, 2018). Menstruation-related knowledge and behaviours among school-aged teenage females are therefore relevant to explore.

Academic performancemay seem simple, it is actually detailed in terms of its proper explanation and its ability to be quantified (York, Gibson, & Rankin, 2015). In addition, academic performance has several interchangeable terms such as academic achievement and academic success which makes it difficult to universally define and operationalize (York, Gibson, & Rankin, 2015). With the complexity of defining and measuring academic performance, most schools use grades and GPA as their measurement tool. Junior high schools in Ghana use grades per term to measure academic performance (Stevenson, 2021). So, in measuring the impact of a condition or something on educational impact, or on academic performance specifically menstrual hygiene management in this study, it is important to examine how it affects the final grade of the girls in junior high schools (Kumbeni, Otupiri, & Ziba, 2020).

The research will concentrate on the effects of menstruation and menstrual hygiene on female students in the chosen schools. Cultural practices, knowledge about menstruation, availability to sanitary products and the environment required for menstruation, as well as psychological trauma and its consequences on JHS girls' academic performance, will be examined.In the study setting, very little literature is available on this subject with no study exploring the possible effects of menstrual hygiene management’s practices among school girls and the cascading effects on the girl child education. It is in the light of above that this study aims at to investigating the effects of menstrual hygiene on the academic performance of Junior high school girls in the Tamale metropolis.

1.2 Problem statement

Education is unquestionably influenced by puberty. Around 57 percent of girls in Sub-Saharan Africa attend junior high school, whereas just 17 percent attend secondary school (Maria, 2018). In a research, the findings of examining the overall influence of menstruation on school absenteeism showed conflicting results, with some girls in Sub-Saharan Africa missing up to three days due to their monthly period, with greater rates in rural regions.

According to Maria (2018), around 52 percent of the female population (26 percent of the overall population) is of reproductive age, and the majority of these women and girls will menstruate for two to seven days each month.In low and middle-income countries (LMICs), girls and women have significant difficulties in regulating their menstruation (Geerz, 2016). Inadequate knowledge, a lack of access to high-quality menstrual products, menstrual taboos, and inadequate water, sanitation, and hygiene (WASH) facilities in schools and communities are all common roadblocks that can have a negative impact on education, employment, health, and other psychosocial outcomes (Philomena, 2010).

According to several research, the majority of adolescent females have limited and erroneous knowledge about menstruation physiology and hygiene. According to the journal of clinical diagnostic research, teenage girls' primary sources of knowledge on menstruation were their moms, television, peers, teachers, and relatives.Poor menstrual hygiene practices coupled with lack of knowledge is responsible for a significant proportion of school absenteeism, seclusion from curriculum and extra curriculum

activities, lack of concentration in class, illness and infection associated with menstruation among adolescent school girls in developing countries (Davis, 2018).

This affects their academic performance in the long run as these activities make up the academic calendar and its results sum up as their final academic results. Being exempted in school activities due to menstruation makes one lose the vital information for a better academic performance and also snatches the chance one can have to make key inputs into their academic results.School attendance for girls has seen a substantial increase in the past few decades due to active advocacy, women empowerment programs, and menstrual hygiene practices which is a part of every girland shouldn't be an inhibiting factor to their access and staying in school for girls.When a schoolgirl misses a significantnumber of lessons due to absenteeism or menstrual hygiene related factors, her academic performance suffers (Vashisht et. al., 2018).

Menstruation has caused several challenges for school-aged girls over the years, according to Kirk and Sommer (2006), including educational, physical, socio-cultural, and economic constraints, all of which can interfere with an adolescent girl's ability to attend school as required and actively participate in class and other school activities as expected. Policymakers have noted that menstrual hygiene habits and a lack of efficient sanitary products are impediments to teenage girls' learning and active class participation, according to Oster & Thornton (2011).

Low academic performance has been identified as one of the main end effects of poor menstruation-related issues in and out of the classroom(Grant, Lloyd, & Mensch, 2013; Miiro et. al., 2018).Moreover, popular media houses over the years have equally reported

that menstrual hygiene challengesare limiting school attendance in Africa(Jewitt & Ryley,2014).The main reason why menstruation has become an inhibiting factor to high academic achievement is because girls lack the materials, knowledge and infrastructure that will enable them practice good and healthy menstrual hygiene processes which will guarantee their safety and comfort in school. But when the practices and facilities are not available, then girls cannot come to school and this will end up affecting their performance in the final assessment.There is currently little context-specific research regarding menstrual hygiene and its impact on the education of girls in the Tamale metropolis. It is for these reasons that this study examines the effect of menstrual hygiene practices on the academicperformance of high school girls in the Tamale metropolis.

1.3 Research questions

1.3.1 Main question

The main aim of this research is to determine the effect of menstrual hygiene management on academic performance among junior high school girls in the Tamale metropolis

1.3.2 Specific research questions

1. What does JHS girls in the Tamale metropolis know about menstrual hygiene management?
2. What menstrual hygiene practices do JHS girls in the Tamale metropolis indulge in?
3. To what extent do menstrual hygiene practices affect the academic performance of JHS girls in the Tamale metropolis?

1.4 Objectives of this study

1.4.1 Main objective

To examine the effects of menstrual hygiene practiceson the academic performance of JHS girls in the Tamale metropolis"

1.4.2 Specific objectives

1. To assess the knowledge of JHS girl in the Tamale metropolis on menstrual hygiene.
2. To examine the menstrual hygiene management practices among JHS girls in the Tamalemetropolis.
3. To determine the extent of the effect of menstrual hygiene managementpracticeson the academic performance of JHS girl in the Tamale metropolis.

1.5 Conceptual framework

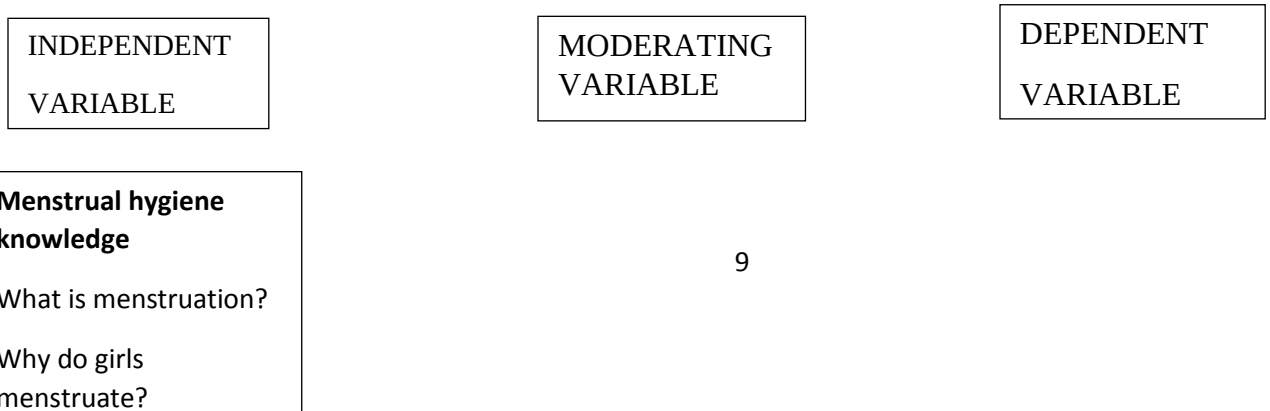

Figure 1.1 Conceptual Framework

1.6 Significance of this study

Menstrual Hygiene is a problem that every girl and woman faces from the time she enters puberty, around the age of 12, until she reaches menopause, around the age of 40.

(Bekakale, chikkal, 2018). The purpose of this study is to look at the impact of menstrual awareness, behaviors, and cleanliness on the academic performance of females in Tamale's junior high schools. This research will also serve as a springboard for future research in this field. The findings of this study may be used by the ministry of education to develop policies that will help females in junior high school improve their performance by taking into account their menstrual knowledge and habits. The findings of this study can also be used by the Ministry of Health to track the effects of junior high school girls' menstrual hygiene knowledge and habits, as well as their health. Other interested parties, such as religious institutions and non-governmental organizations (NGOs), can use the findings of this study to develop policies relating to the welfare of JHS girls, as well as decisions about WASH in schools, adolescent health issues, and a variety of other informed decisions.

The study findings may be useful towards the formulation of a Code of Ethics for junior high schools. The Code of Ethics may have a Chapter on the best menstrual hygiene practices and management by all stakeholders in Ghana.

1.7 Limitations

During Data collection, due to the COVID-19 restrictions, only JHS2 students were in school and when the JHS3 and 1 are due to report, they, the JHS2 students will be on

vacation, therefore data collection had to be done at separate times which caused a delay in data collection.

Also,this situation forced the researcher to conduct focus group discussions among same year students instead of a joint one that would have yielded experience sharing and cross learning.

The effect of menstrual hygiene is not measured as such the study is unable to quantify the effect of MHM on academic performance.

1.8 Organizations of this study

This thesis consists of six chapters. This chapter, chapter one has introduced the study and outlined its focus. It consists of the background, the problem statement, the main and specific research questions, the main and specific objectives, and a conceptual framework, significance of the study, limitations and the organization of the study.

The chapter also discusses the context of the study in which the definition of menstruation, menstrual practices and the cultural and societal practices associated to it and it impact on the education of junior high school girls in the Tamale metropolis

Chapter two focuses on the review of relevant literature on the subject under investigation.School environment and its impact on the menstruating adolescent as well as changes that take effect in her life and educational life will also be reviewed.

Chapter three focuses on the research methodology and research design. It discusses the research design, composition of the sample, sites and population. The chapter also discusses different methods used in capturing, recording and transcribing, and analyzing the collected data.

Chapter four was devoted to the presentation of the results of the study. It uses tables and graphs to summarize and categorize data collected.

Chapter five focuses on the discussion of the results in line with existing literature.

Chapter six takes care of conclusion and recommendations if any.

CHAPTER TWO

LITERATURE REVIEW

2.0 Introduction

This chapter of the study presents an in-depth review of literature on menstruation and menstrual hygiene management (MHM). The current review is based on the following topics; definition of childhood menstruation and MHM, significance of MHM, associations between MHM and school absenteeism, sustainability of MHM resources, family support and MHM, Infrastructural support systems about menstruation within school context and associated factors of MHM.

2.1 Menstruation

After the age of ten, menstruation takes on a monumental significance in the procreative lives of all women. It is one of the puberty stages and a sign of reproductive maturity (Ameade & Garti, 2016). Nature brings about a variety of changes in the period leading up to puberty, including huge physical and emotional changes that all occur at the same time and gradually lead to womanhood(Mahon & Fernandes, 2010). The onset of menses is one of these alterations. The "recurring loss of the uterine lining on a regular basis in reproductive-aged females during monthly menstrual cycles" is referred to as menstruation according to Aniebue et al., (2010). Menstruation normally begins between the ages of 8 and 16, continues monthly, and terminates in menopause, resulting in approximately three thousand (3,000) days of menstruation in a normal woman's lifetime (Aniebue et al., 2010). Normal monthly bleeding lasts 4 to 6 days, with an average blood loss of 3.5 tablespoons (30-80 milliliters) every day (De Sanctis et al., 2015). In 88

percent of the cycles studied, Dewhurst, Cowell, and Barrie (1971) discovered that the flow of blood during menstruation extends three to seven days (hence between three and seven days), with 5 days being the average length of menstrual blood flows(Dewhurst et al., 1971). Gumanga & Kwame-Aryee (2012) found that the average length of menstrual flow among 465 girls tested was 4.9 days, with the majority of the girls experiencing 5 days of menstrual flow and a median of 5 days. Menarche, or the first menstruation, is one of the most prominent puberty occurrences(Gumanga & Kwame-Aryee, 2012).

Various studies conducted to determine the age of menarche have revealed a mean menarche age of 12.5 ± 1.28years in Accra, Ghana (Gumanga & Kwame-Aryee, 2012), 13.66 ±1.87 years in Tamale, Ghana (Ameade & Garti, 2016), 11.9 ±1.2 years, Legon, Ghana (Emmanuel & Yawson, 2019), 12.8 ± 1.31 years in Kano, Nigeria (Garba et al., 2018), 12.1 ±1.6 years in Egypt (Nooh, 2015), 13.52 ± 1.33 years in India (Pradeepkumar et al., 2019), , 12.27 ± 1.08 years in Indonesia(Aryani et al., 2018) and 12.4 ± 1.31 years in Italy (Rigon et al., 2012). It can be inferred from the aforementioned that, the age at menarche varies from person to person. Regular ovulatory menstrual cycles in a normal woman occurs mostly by 21 days and not more th.an 35 days, which may last between 2 and 7 days with a blood loss of not less than 25 milliliter (mL) and not more than 69 milliliters (mL) on the average (Lee PA., 1996). A multicenter study in Italy found that 114 people (3%) had menstrual cycles shorter than 21 days and 129 people (3.4%) had menstrual cycles longer than 35 days (Rigon et al., 2012). Another multicenter, cross-sectional study of Pakistani girls' menstrual knowledge and practices found that 39.5 percent of respondents knew that the menstrual cycle length is between 21 and 35 days, that the majority (76.1 percent) could tell the duration of menstrual bleeding (i.e.,

between 2 and 7) and that nearly 30 percent of the participants knew that menstrual blood was sourced to the uterus. “Around 27% understood it as monthly bleeding happening with every woman, whereas 18% stated that it was a sign of adulthood”(Mansoor et al., 2020). The menstrual cycle runs from the first day of menstrual bleeding to the day before the next period. "The anterior pituitary gland begins secreting gonadotropin hormones, such as follicle stimulating hormone (FSH) and luteinizing hormone (LH), under the pulsatile secretion of gonadotropins-releasing hormone (GnRH) from the hypothalamus" between the ages of 8 and 9 years (Kaplowitz, 2006). The key characters in the menstrual cycle are these hormones. The follicular phase (menstrual bleeding phase), ovulatory phase (estrogen phase), and luteal phase are the three (3) phases of the cycle (the progesterone phase)(Mtawali et al., 1997). The length of a woman's menstrual cycle varies. This is owing to the fact that the follicular phase differs from one person to the next. The luteal phase, which lasts around 13 to 14 days in most women, is pretty consistent (Sperroff L, Glass RH, 1999).

The Follicular Phase (Days 1-14): This stage usually lasts between 1 and 14 days. It begins on the first day of menstruation, which is marked by blood flow, and ends with ovulation. Follicle stimulating hormone (FSH) is released by the pituitary gland, which is part of the endocrine system, and it activates many follicles carrying ova on the ovary's surface. One of the follicles becomes dominant over time, while the others fade away. A single developed egg grows within it. The estrogen produced by the growing follicle rises progressively until it reaches its peak one or two days before ovulation. The lining of the uterus thickens and becomes more echogenic when estrogen levels are high (De Sanctis et al., 2015) in preparation for implantation and the stimulation of the gonadotropin-

releasing hormone (GnRH), which in turn stimulates the pituitary gland to secrete luteinizing hormone (LH). The high surge in L.H. and F.S.H. results in the bringing out of the egg from the follicle (Sunay et al., 2011).

Ovulatory Phase (Day 14): The ovulation process is at the heart of the menstrual cycle (Crosta, 2015). The developed egg is released on the 14th day of the cycle and travels via the fallopian tube to the uterus. If viable sperm is present, fertilization may take place in the tubes or uterus. The egg will rupture within a day if it does not get a viable sperm to fertilize it (24 hours). The burst follicles from the egg remain on the ovary's surface for about two weeks before changing into the corpus luteum, a structure(Sunay et al., 2011)

Luteal Phase (Days 14-28): After the egg is released in the ovulatory phase, FSH and LH levels drop considerably. Progesterone is produced by the corpus luteum. It's worth noting that if there isn't a pregnancy, the corpus luteal withers and dies(Jabbour et al., 2006). This progesterone is in charge of keeping the uterine lining from shedding. The widespread consensus is that as progesterone levels drop owing to corpus luteum death, the uterine lining falls away, triggering menstruation in women. The shedding is shown as menses, which last an average of 5 days and are generally the heaviest (blood flow) on the first two days.

2.2 Problems associated with menstruation

Teenagers and young women are frequently related with menstrual issues or abnormalities. Pregnancy, illness, cancer, trauma, hormonal disturbances, mental stress, the environment, excessive physical activity, or nutritional difficulties can all cause menstrual cycle abnormalities(Adam et al., 2009). Heavy periods, nonexistent periods, and painful periods are among the problems.

Menorrhagia, or heavy menstrual periods, entails more bleeding than usual, with periods lasting 5 to 7 days. Hormone imbalances caused by illnesses, puberty, thyroid disorders, and dietary changes are the most common causes(Brawner et al., 2016).

No menses or amenorrhea simply means that you haven't had your period in a while. When a girl reaches puberty age but does not get her first period by the age of 16, she is said to have primary amenorrhea. This is due in part to thyroid gland abnormalities, eating disorders, and excessive exercise, all of which result in low body fat levels, a female reproductive system birth abnormality, pituitary adenoma, or a puberty delay. Secondary amenorrhea, on the other hand, happens when a woman's regular menstrual cycle is disrupted for six months or more.

Oligomenorrhea is defined as a condition associated with infrequent menstrual periods and is mostly operationalized as menstrual cycles that span from 35 to 90 days. It is very often termed as ‘long cycle’ (Ross, 2014). In a study conducted in Indonesia, 30.6% of the study participants were said to have developed abnormal menstrual cycle which consisted the following; 24.5% developed Oligomenorrhea, 5.9% had polymenorrhea, and about 0.2% complained of amenorrhea (Aryani et al., 2018).

Hypomenorrhea is a rather uncommon condition. It is commonly characterized as menstrual flow that lasts less than two days. The volume of menstrual blood flow is very low, and it is not known to be linked to significant illness (hypomenorrhea) (De Sanctis et al., 2015).

Dysmenorrhea is a painful menstruation characterized by cramps that occur as the uterus contracts to evacuate shed lining and egg fragments. Dysmenorrhea is one of the leading reasons of gynecological hospital visits across the world, with serious physical, emotional, spiritual, scholastic, and societal effects(Osonuga & Ekor, 2018). According to a study conducted in Ethiopia, teenage females with premenstrual symptoms are more likely to suffer from dysmenorrhea than those who do not have any premenstrual symptoms(Zegeye et al., 2009). In Egypt, almost all (representing 94.4%) of school-going girls testified experiencing dysmenorrhea (El-Hameed, N. A. A. Mohamed, M. S. Ahmed, N. H. Ahmed, 2011).

The occurrence of painful menses is so common that it is often dismissed as normal. For example, in rural Malaysia, the majority of adolescent females regard dysmenorrhea as a natural part of menstruation(Wong, 2011). The impact of dysmenorrhea was studied in a comparative research involving 200 female undergraduate students at the University of Cape Coast in Ghana, with 100 offering health-related courses and the other 100 giving humanities or non-medical courses. Dymenorrhea was shown to pose significant difficulties in the respondents' participation in academic and non-academic activities. It resulted in mood swings, distraction in social interactions (resulting in alienation from peers and university personnel), sleep deprivation, and time lost due to hospitalization(Osonuga & Ekor, 2018).

In research done in Zagazig, Egypt, to "determine the type and incidence of menstruation diseases among the young female students". It was noticed that roughly 17 representing 6.0 percent of the respondents had a history of Oligomenorrhea whereas 6 others (representing 2.1 percent) claimed having polymenorrhoea. Hypomenorrhea was also observed in 20 pupils (representing 7.1 percent), whereas hypermenorrhea was observed in 15 kids (representing 5.3 percent). Twenty-two students mentioned irregular menstruation (representing 7.8 percent of the respondents). Dysmenorrhea was reported by the majority of the pupils 185 (65.4 percent of the responses) (Nooh, 2015). Menstruation has spiritual (religious) and cultural (traditional) overtones that have the potential to influence young girls' feelings about the issue. There is a belief in certain communities and homes that a menstrual adolescent girl is unclean or impure, and as a result, she is treated differently by limiting her movements and connections.

Strangely in some cultures in the African continent, the subject of menstruation is chiefly seen as a taboo(House et al., 2012) and "traditional houses are reserved for use by menstruating women so as to keep them from coming into contact with other people until night fall. In other settings, she is not allowed to approach holy grounds, touch holy books and other holy objects" (JUAYIRE, 2016). Domestic work for example cooking was frequently referred to as 'not allowed' for girls during their menses in India(Thakre et al., 2011), and in some parts of Africa; Kenya (McMahon et al., 2011), and Nepal (Adhikari et al., 2007). According to UNICEF research conducted in Kenya, one out of every ten school-aged females will miss school during their menstrual cycle. Another case study in Uganda found that 94% of 300 primary school girls enrolled in the study

reported difficulty in school during menstruation: Three out of five girls (60%) said they didn't go to school(Ziba et al., n.d.)

2.3 MHM products (absorbent materials) used during menstruation

For millions of women, feminine hygiene products are an important aspect of their lives during menstruation. A woman's cycle lasts roughly 37 years and she has 13 cycles every year (Wiesemann & Adam, 2011). Cloths, reusable and disposable pads, panty liners, tampons, and menstrual cups are among the hygienic items used to capture menstrual flow(UNICEF, 2019). The fundamental needs of users are to feel clean and dry, safe and in control, as well as for comfort and ease (Wiesemann & Adam, 2011). Personal preference, cultural tolerance, economic standing, and local market availability all influence sanitary protection material selection(Kaur et al., 2018). According to UNICEF (2019), there is no one menstrual product that suits every girl and woman in all settings. These differences arise as girls and women have different needs and preferences of MHM materials and these further depends on whether they are at home, at work, or in other public settings (UNICEF, 2019). Girls in India preferred to wear sanitary pads at school and clothes at home, according to certain surveys(Nair et al., 2012; Thakur et al., 2014). Still on preferences, Allah and Elsabagh (2011) found that many secondary school girls in Zagazig City, Egypt, admitted to using sanitary pads during the first two days of their cycle, when the menses are stronger, and then switching to cloths for the remaining several days (Allah & Elsabagh, 2011). According to Kaur et al (2018), the absorbent materials most commonly utilized in most poor regions are reusable cloth pads, whereas women in metropolitan areas prefer to use commercial sanitary pads (Kaur et al., 2018).

With regards to the commonly used menstrual products, several studies conducted in developing countries reported that sanitary pads, cloths and tissue paper as the most commonly used menstrual hygiene products(Chandra-Mouli & Patel, 2017). In Ghana, (Asimah et al., 2017) and Nigeria (Aluko et al., 2014; Oche et al., 2012), Zambia (Lahme et al., 2018) showed that girls in secondary school mainly used sanitary pads. In Uganda, reusable pads were the most commonly used followed by cloths, disposable sanitary pads, toilet paper, underwear alone and sponge (Hennegan et al., 2016).

Menstrual blood is absorbed by sanitary pads. The absorption capacity of a substance is defined by its rate of uptake and the volume of liquid it can store(Gupta, 2014). The ability to manage varied densities of menses under a variety of settings and activities, as well as being simple to use, pleasant, and dispose of, is a fundamental performance criterion for such materials (Wiesemann & Adam, 2011). A top sheet, an absorbent core, and a back sheet make up most sanitary pads. Fluid is funneled into the core by the top layer. The absorbent core is usually seen as a variation in sanitary pad brands. Polyacrylate, chlorine-bleached Kraft or sulphate pulp, cotton, wood pulp, bamboo pulp, banana fiber, bamboo fiber, sea sponges, and water hyacinth are all absorbent core materials (Kaur et al., 2018). The absorbent core is sometimes liaised with odor absorbent materials such as zeolites and cyclodextrines and sometimes with inhibiting bacteria growth chemicals (Wiesemann & Adam, 2011). The back sheets then prevent moisture in the core from seepage. The sheets may be impermeable, semi-permeable (breathable; allows water vapor to pass through) (Wiesemann & Adam 2011).

Menstrual hygiene products can be broadly classified into disposable (single use) and re-usable products. Disposable products: single use products (disposable sanitary pad and

Tampons) whiles the reusable products (reusable sanitary pad, cotton and menstrual cup) (WaterAid, 2019).

Disposable Sanitary pads; The absorbent core of these sanitary pads is constructed of wood pulp and ultra-absorbent polymers such sodium polyacrylate gel. The top layer is usually constructed of non-woven fabric based on polypropylene, while the back sheet is made of polyethylene (WaterAid, 2019). They are widely available in supermarkets and pharmacies, albeit they are more expensive than cotton pads (Kaur et al., 2018). The pads must be worn outside of the body with support underwear and discarded after a maximum of 8 hours (UNICEF, 2019). Pads may degrade after prolonged usage, leaving users vulnerable to leaking and discoloration (WaterAid, 2019). They have a variety of features, including perfumed, extremely thin, superabsorbent, and therapeutic qualities (Elledge et al., 2018).

Disposable Tampons; Internal protection is provided by this sort of absorbent. They are put into the vaginal canal to absorb menstrual flow and are composed of cotton and/or rayon. They can be worn for up to 8 hours before being taken off with a removal string and discarded (UNICEF, 2019). Tampons must be put into the vaginal canal, which is a hurdle to adoption in many cultures since it is incorrectly connected with hymen ripping and virginity loss. Tampons' low patronage (1–4%) in low-income nations can be attributed to this, as well as a lack of awareness of the product (UNICEF, 2019). Tampons knitted from natural materials such as bamboo and hemp can be used as washable tampons when combined with cotton or wool (Kaur et al., 2018).

Disposable pads and tampons provide several advantages, including the availability of pads in many regions of the country. Tampons, on the other hand, are still limited in

Ghana, despite the availability of low-cost product alternatives. Because these pads are the most commonly used by students and the educated, they are given out for free or sold at heavily discounted prices, making sanitary pads more accessible (WaterAid, 2019). Tampons are compatible with intrauterine devices (UNICEF, 2019).

Disposable pads and tampons also have the following disadvantages: "Limited disposal and waste management solutions for one-time use pads, may be expensive in some circles when compared to cloths, use of a single pad may be extended beyond a reasonable time, putting users at risk of leakage, irritation, and even infections." Toxic shock syndrome (TSS) is a serious consequence of certain bacterial infections that is frequently linked to tampons because the bacteria can grow in the blood that collects in the tampon. TSS might be increased by using a tampon for longer than suggested" (WaterAid 2019; UNICEF, 2019).

Compostable sanitary pads are another form of disposable sanitary pad. When compared to normal disposable sanitary pads, these offer a more natural absorbent core comprised of wood pulp, banana fiber, and pine that decomposes quickly. Unlike normal pads, the back sheet is constructed of bio-plastics and adhesive. They cost more than standard disposable pads (WaterAid, 2019).

Reusable Sanitary Pads; The absorbent core component of these goods differs from that of disposable sanitary pads. Cotton, microfibre, polyester, and other absorbent textiles make up the top sheet and absorbent core. Polyurethane laminate is commonly used for the back sheet. The pad is worn on the exterior of the body and must be worn with underwear to stay in place. Pads that are reusable can be used for up to a year (UNICEF, 2019). Some are made to be worn without the need of underpants (have waste straps to

secure product). Products should be properly soaked and washed in room-temperature water with mild soap (not antiseptic solutions), dried thoroughly, and kept in a clean, dry environment (WaterAid, 2019).

Cloths and cloth pads; Cloths are reusable cloth pieces worn on the outside of the body, in underwear, or wrapped around the waist to absorb menstrual flow. Cotton is commonly used in the fabric, whether new or old (repurposed from old apparel) (UNICEF, 2019). Cotton fabric may be the ideal surface material since it absorbs liquid at the fastest rate, dries quickly, and is deformable (Gupta, 2014). The pad must be changed every 4-6 hours, and it has a life duration of up to 100 washes, which equates to 2-5 years of use (WaterAid, 2019). Cloths are inexpensive and widely accessible in most situations (UNICEF, 2019).

"Many reusable products have desirable qualities such as leak-proof layer and wings that protect against leakage and staining reduces waste load, some product variants are easy to wash, dry, and store, and many reusable products have desirable qualities such as leak-proof layer and wings that protect against leakage and staining"(Kaur et al., 2018).

Reusable pads and cloths, on the other hand, have a limited availability, are more expensive than disposable sanitary pads, and the use of a single pad may be extended beyond a suitable duration, exposing users to leakage, irritation, and even infections(WaterAid, 2019), cotton used in making certain pads may contain pesticides (Kaur et al., 2018), there might be an association with urinary tract infections and bacterial vaginosis, and the use of damp cloths and pads can lead to skin irritations (UNICEF, 2019).

Menstrual Cups: is a bell-shaped non-absorbent device that is put into the vaginal canal to collect menstrual blood. It is held in place by the vaginal walls (UNICEF, 2019). The cup is composed of molded medical grade silicone, making it simple to fold and insert (Kaur et al., 2018; WaterAid, 2019). After each monthly cycle, menstrual cups should be boiled for at least five (5) minutes. It collects three (3) times the amount of menstrual blood as pads or tampons and must be evacuated every 6-12 hours (depending on the monthly flow), washed, and re-inserted. The cup must be boiled for 5-10 minutes after each menstrual cycle (UNICEF, 2019).

Advantages of the menstrual cup includes; it generates minimal waste, it offers sustainable, practical, and cost-effective alternative where sanitation conditions are not good (Kaur et al., 2018). Disadvantages of menstrual cup include; "limited availability and higher cost, need to be inserted vaginally – may not be acceptable to many users, unclean cups or cups worn for over 12 hours are harmful and may be associated with infections. In extreme cases, toxic shock syndrome may occur" (Water Aid, 2019).

2.4Knowledge on Menstrual Hygiene Management(MHM)

Menstruation can be defined as a natural process of the reproductive cycle of females involving the flow of blood from the uterus via the vagina/ female reproductive organ (House et al., 2012). Menstrual blood, simply defined, is the blood and tissue raptured from the endometrium, or surface lining of the uterus. This blood is known to be free of any toxins and also does not contain any bacteria except ones that are “good bacterium” which is found biologically in the vaginal canal.Menstruation starts at puberty and its special to females. On the average, a girl loses about four (4) tablespoons of blood in a flow each month. During this period, a cycle of events occurs in the ovaries which bring about changes in the uterus and the female body. Studies have shown that, most females experience their first menarche between the age range 11 and 14years, nevertheless some starts as early as 8 and others as late as 17years (Alberda, 2018; Mohammed et al., 2020). During mensuration, girls encounter some number of feelings which includes: shame, fear and guilt because of inadequate knowledge and information (Oche et al., 2012).

Effective communication and flow of information between the adolescent girl and the family is very essential in menstrual hygiene management. This is because various behavioral changes which are related to sexual activeness begins at the early stage of the adolescent girl (Ayalew et al., 2014). Various forms of care and love should be showered on the adolescent girl at this stage of her life. Moreover, support and advice are also essential factors when it comes to menstrual hygiene management. Most often than not, adolescent girls who lacks some education about their sexual life from home are at a disadvantage and not prepared for menarche (Kirk et al., 2006). The result of this may be psychological instability on the part of the adolescent girl. In instances where there is

lack of sex education from home due to cultural reasons or lack of experience, adolescent girls could easily be influences by their peers and thus its absolutely necessary for parents to enlighten their children during this stage of their life (AlQuaiz et al., 2013)

The angle through which girls view menstruation also impacts their menstrual hygiene practices during their menstrual flow (Lawan, 2010). Girls with clearer understanding and knowledge of menstruation usually have safer and cleaner ways of managing their menstrual flow and vice versa (Adinma, 2018). A study conducted in india revealed that knowledge regarding menstruation before menarche was found to be low among both rural and urban girls at puberty in the Maharashtra state (Deo, 2005). This limited information was transferred informally from mothers, who were also lacking some vital information regarding menstruation, sexual reproductive health and menstrual hygiene which could be attributed to low literacy rate and low socioeconomic status (Dasgupta, 2008). However quality informationregarding menstrual hygiene management reduced the exposure of girls to the risks accompanying poor menstrual hygiene management (Dasgupta, 2008).Adolescent girls in the urban areas of Karachi, Pakistan, had difficultyin managing menstrual hygiene because of lack of supportive and friendly infrastructure to change, and dispose of used absorbents in school and also the lack of privacy when dry washed absorbents at home (Ali, 2010) Lack of privacy to practice with ease and peace menstrual hygiene in school was associated with absenteeism among these young girls in Nepal (WaterAid, 2010).

Poor menstrual hygiene management can be a cause for reproductive and other genitor and urinary tract infection, cervical cancer, school absenteeism, school drop-out, poor academic performance, low self-esteem and poor quality of education and life (Tegegne,

2014). Moreover, girls have more than often experienced feelings of pain, despair and fear during their menstruatingdays as a result of the accompanyingodour, leakages, staining of clothes and the unknowing dropping of sanitary materials sometimes during their class sessions (Fakhri, 2012). This can have a negative impact on their concentration, class and extra curriculum participation and self-esteemwhich in return affects their academic performance(Poureslami & Osati-Ashtiani, 2002).

2.1.1 Sources of information regarding Menstruation and menstrual hygiene

Receiving informed and understandable information/ education about biological details and the aspects of good MHM and practices is importantto help ensure that girls can act on factual knowledge. In many LMIC there is no stipulatedas well as very scanty education in schools regarding menstruation and MHM. Teachers are sometimesreluctant or simply not willing to discuss menstruation and menstrual hygiene management due to the norms, taboos, or simply being uninformed themselves regarding the issue. Women mostly receivesuch information from their family especially, mothers (Winkler, 2014).

Because of similar religious and cultural beliefs in Egypt, menstruation is not considered an appropriate matter of discussion, resulting to the lack of factual and comprehensive and readily accessible information on menstruation and menstrual hygiene.

In a study conducted by Alexandria 1990, which found contrasting the above statistics, mothers scored the highest common source of knowledge on menstruation and its related physiology before and even after menarche, with classroom and the mass media playing a scanty role (El-Gilany, 2014). Girls in the above two studies mentioned in the two paragraphs above, somehow, pointed to the mass media, peers and friends, mothers, and

other female family members especiallymothers as their notable sources of menstrual hygiene information (Poureslami & Osati-Ashtiani, 2002). In a study conducted in Saudi Arabia, however, almost two-fifths of the respondents had never discussed menstruation and its related physiology with anyone including family members and had also not received any factual information about it (Moawed, 2000).

In 2019, a study conducted in Ethiopia also revealed that27.7% of respondents who are adolescents did not have basic knowledgeabout menstruation and its related menstrual hygienemanagement practices before their first menstruation. Out of the 72.3% respondentswho hadknowledge regarding menstruation, before menarche, 38.3% named their mothers and other female family members as their main source of information and the remaining 16.3% mentioned their friends and peers as their source of information. Family, school teachers, mass media and other sources were equally mentioned as sources of information regardingmenstruation and menstrual hygiene management (Belayneh et al., 2019). The study also revealed one third, (33.9%) of respondents did not use sanitary pads but rather locally invented absorbents during their days of menstruating. About 42.4% were using commercially made sanitary pads, and 23.7% used homemade absorbents (dry clothes, double pants, sponges…). More than half, (69.5%) of students clean their external genitalia with water and soap. Generally, 60.3% of girls found to have poor menstrual hygiene practice (Belayneh et al., 2019).

2.5Menstrual Hygiene

A growing amount of research from low- and middle-income countries recorded that many women and girls are not able to manage their menses and its associated hygiene practices with the necessary ease and dignity. This lack of access and comfort is even more severe for girls and women in rural areas. These girls and women happen to not get this comfort at home, at school, at work and even in other public settings, due to a long combination of unfavorable social environment, lack of adequate information, unfriendly WASH facilities, and a very scantyvariety of absorbent pads. Public buildings and policies in health WASH, and education does not prioritize and include MHM resources. In addition, myths and taboos often promote a high level of secrecy about basically all facts associated with menstrual hygiene, even the most basic ones – promoting shame and exemption for women and girls. Unfriendly WASH structures, lackof access to quality information and materials are among some barriers for women and girls with disabilities in managing their menstrual hygiene.

According to the World Health Organization and UNICEF, menstrual hygiene management is “the use of clean menstrual management material to absorb or collect menstrual blood that can be changed in privacy as often as necessary for the duration of a menstrual period, using soap and water for washing the body as required, and having access to safe and convenient facilities to dispose of used menstrual management materials”(Dutta et al., 2016).

Poor hygienic practices by humans may bring about the outbreak of diseases which may consequently lead to complicated health conditions and loss of lives (Assefa et al., 2014). A prior research has associated poor menstrual hygiene management with severe health

problems such as urinary and reproductive tract infections (Dasgupta et al., 2008). This mean that, when females use unclean sanitary material to collect flowing blood from the vagina may expose them to higher risk of developing infections.

These are WHO guidelines concerning hand hygiene in order to increase and improve good hygiene practices despite the background or resource types (Allegranzi & Pittet, 2009). Public Health practitioners have put more interest in the need to effectively wash hands since it's a significant method for disease transmission, Also, the pattern of sanitary facility utilization and practices of hand washing are also emphasized by these practitioners (Assefa & Kumie, 2014).

Adolescent girls are exposed to various social, and health risks owing to poor hygiene practices and misconceptions during menstruation. This may also lead to stigma because of the bad odor associated with the menstrual blood which can easily be distributed all over the body when the girl child lacks proper hygiene. These consequences are normally due to poor hygienic practices such as using unhealthy sanitary facility, improper hand washing and cleaning of genitals and societal norms or cultural practices like female genital circumcision which may increase her risks of poor health conditions. A study conducted in 2014, reviewed studies in low-income countries describes the associations between MHM and urinary and vagina tract infections. The finding of this study is tabulated below:

Table 2.1: Menstrual practices and their associated health risk

Menstrual practice	Associated health risk
Poor and unclean sanitary materials	Infections may travel to vagina and uterine cavity caused by bacterial
Infrequent change of materials	Skin irritation may be caused by wet sanitary materials and may even get infected
Inserting unsafe/unclean material into the vagina	Bacteria have quick access to the uterine cavity and cervix
Unprotected sexual intercourse	High risk of sexually transmitted diseases and sexually transmitted infections in menarche
Poor disposal of already used sanitary materials	High risks of STDs and STIs to others
Poor hand washing practices washing hand after changing sanitary material	Rapid spread of infections such as Hepatitis B

Source: UNICEF, 2015, WASH for girls

The effects of this on the society is that the absence and poor MHM wasted the efforts which were targeted at achieving the Millennium Development Goal 2 and 5; to achieve a universal primary and basic education and maternal health improvement prior to the end of 2015 (Chin, 2014).

In furtherance to the above, the efforts which are targeted at achieving the Sustainable Development Goal 3; to ensure and promote healthy lives and wellbeing for all at all ages, goal 4; to ensure inclusive and equitable quality education and promoting lifelong learning opportunities for all and goal 6; ensuring the availability and sustainability of water and sanitation were frustrated as result of poor MHM (Asumah et al., 2022)

It is therefore critical to assess the menstrual hygiene management among Junior High Schools in the Tamale Metropolis in order to raise the awareness, improve the level of knowledge and provide ways to tackle the variety of health challenges which are associated with it. The education of the girl child is very crucial and may yields significant impact to her, her people, the society and the country at large (Boosey et al., 2014).The available literature has revealed that the Ministry of Health in both high and middle-income countries now place more emphasis in reproductive health including school health. For instance, studies have shown that, Iran has incorporated health education and hygiene practices into the routine education. Research has revealed that, the level of misconceptions and practice regarding menarche decreases as a result health education (Fakhri et al., 2012).

Amazingly, a prior study found that 60% of students did not know the possibility of illness transmission via human waste such as menstrual blood (Vivas et al., 2010). Another study revealed that majority of the study participants lacks knowledge of the source of menstrual blood despite 67.5% of them having awareness of menstruation prior to menarche. The implication of this may result to various health risks and social challenges. Thus, adequate knowledge on the concept of menstruation in the body, risks involved in academic performance, unwanted pregnancy, and sexually transmitted

disease resulting from MHM could effectively improve the health of the adolescent girl and her academic performance. (Kirk et al., 2006).

To improve girls' and women's menstrual health and hygiene practices, these areas as suggested by UNICEF in its 2019 menstrual hygiene report are very crucial to start with:

Social support: Many girls and women face major discrimination with regards to the beliefs surrounding menstruation that makes them to feel their menses are a shame and source of embarrassment. Further experiences when they attend school also reveal common problems;this is often associated withthenorms and already existing social beliefs: stress associated with cramps, teasing from colleagues, and a variety of problems on almost everything, from her school attendance/ punctuality to appetite for food. School going girls must be able to partake in all activities, both curriculum and extra curriculumin times of their period without having to beingfaced with stigma or exemption from teachers, friends, parents, or even community stakeholders. Community engagements regarding menstruation and menstrual hygiene includingboys, men, traditional and religious leaders, is a great tool to changing the misconceptions, hygiene and associated practices.

Knowledge and skills: Many girls start menstruating without even the basics of knowledge regarding menstruation and menstrual hygiene, which brings in panic and shock for the first time an adolescent girl sees her menstrual blood. This information ends up coming too late, after a girl has seen her first menstrual blood, or in the worst cases the information is not given at all.This can be due tonormssurroundingadolescent education with regards to sexual and reproductive health. Ideally before girls reach menarche, they

need the basicinformation of the biology of the menstrual cycle and the chances to be educated and armed with the skills to safely and independently manage menstruation – and the discomfort and pain that they are likely to experience during it.

2.5 Menstrual hygiene practices among JHS girls and academic performance

2.5.1Sanitary products availability

Access to the safest and dignified menstruation is a fundamental need for women and girls.

Although there are no objects to back this, in Ancient Egypt, there were laundry lists that included and further confirmed the existence of cloth pads in those days. A low socio-economic status was given to the people who went in for the job of washing the "loincloth of menstruating women", this statement further supports the assumption that the act of using cloth pads, was present in those times.

The effectiveness of MHM is highly influenced by the availability of sanitary products such as absorbents, soap, water and sanitary facilities. Studies have shown that, a wealthy and an effective MHM highly also depends on the supply of clean water which would be used for washing and cleaning. The availability of menstrual products which could be used for changing among menstruating women in schools is also way of achieving effective menstrual hygiene among school going girls(Parker et al., 2014).

The choice of sanitary absorbing material is based on factors such as; personal preference, cultural recognition and acceptability, economic status, and affordability and availability in the market. Along with basic sanitation facilities, girls should be also

provided with soap and clean water to manage menstruation and menstrual hygiene. However, the preference of absorbents differs among rural and urban women and girls.

In rural areas, the most go to absorbents are the reusable cloth pads and in urban areas women go for sanitary pads (Krosea, 1990).

A study conducted in Government schools revealed that, when menstrual sanitary materials such as soap and water are available hygienic improved and the wellbeing of the adolescent girl is also improved. Notwithstanding, the unavailability or inadequate access to menstrual resources could explain why the girl would not wash her hand properly or effectively manage her menstrual hygiene (Ribeiro et al., 2013; Vivas et al., 2010). Sometimes the availability of these facilities does not translate to adequate access to it. Poor management of menstrual hygiene could result from depriving women from having access to functioning sanitary facilities. The association between MHM and resources has been of interest to the Government of Ghana over the years with the Ministry of Education targeting to improving equity and access in 15 senior high schools and providing scholarship to girls which include provision of sanitary materials (Konlan,2020).

Studies have revealed that eight environmental and structural factors have been found to have some effect on the adolescent girl in terms of her health, wellbeing and dignity during menstruation (Sommer & Sahin, 2013). These factors are: lack of menstruation services and sanitation systems such as poor toilet facilities with the absence of water, lack of access to water close to the latrine, inadequate dormitories to provide comfort to the adolescent girl during mensuration. Poor teaching skills and knowledge of

reproduction by teachers, Inadequate facilities for disposing used sanitary materials in schools, a far distance between classrooms and pit latrines, majority of the school staff being males, mode of discipline especially canning at the back side, strict policies in schools that may discourage interactions between students and teachers. Maintaining the availability of water, latrines and good hygiene is a great problem in low-income countries. Therefore, it was suggested by a previous study that structurally sound pit latrines which are appropriate for mensuration should be constructed in schools (Oduor et al., 2015).

Previous researchers have associated effective menstrual management practices with socioeconomic factors. This is owing to the fact that, the girl child should be from a household of good socioeconomic status to practice good hand washing and cleaning, good sanitary materials and cleaning the body to prevent smell and dirt (Assefa & Kumie, 2014). To effectively practice MHM, the adolescent should not be from a background of low socioeconomic status, because she may not afford to buy good sanitary materials for cleaning and washing. Thus she may use unsafe materials or poor sanitary materials which may increase their risks of infections and diseases compared with adolescent from high socioeconomic background (Ribeiro et al., 2013).

The vulnerability and security of the adolescent girl increases when they wear unsafe clothes; and are torn and dirty during menstruation. The type and quantity of sanitary materials the girl may use would be determined by her financial status or poverty level. Thus, it is critical to improve the access of menstrual materials including sex education prior to menarche (Omidvar & Begum, 2010). Moreover, Studies found association

between disease burden and inadequate MHM and this may escalate their risks to HIV and poor pregnancy outcomes (Sumpter & Torondel, 2013).

One of the key factors that can highly influence MHM is cultural beliefs and norms. Some of these beliefs and norms prevent the menstruating women from activities which include: bathing, cooking, and even sleeping at home (Chin, 2014). Despite the long existence of these societal beliefs and norms, it still has a significant impact on the behavior of the women concerning menstruation (Yagnik, 2015).

Owing to the false and myths associated with menstruation, studies have revealed that most women have some difficulties in learning about menstrual hygiene practices with some of them taking it as a taboo and others consider it a secret issue (Kirk et al., 2006). In other to resolve these problems associated with menstruation, there is the need to intensify education via schools and homes (Vivas et al., 2010). With education, the adolescent girl is able to see the need and necessity of washing hands. This also necessitates that, factors that could contribute to handwashing practices should be given due attention. This is vital owing to the link between the adolescent and her clean and healthy hands as well as societal development (Vivas et al., 2010).

2.6 Menstrual Hygiene management in school and academic performance.

Academic performance in education is the most important measure for progressive impactful education. Failure to excel in academic performance predicts failure for the students whose life comes to a halt and full of confusion. Academic performance predicts whether a pupil will proceed to the next level of education or not. Therefore, a pupil's life and success in education is to a larger extent determined by their academic performance. As a result, school administrators are pushed to enhance buildings and circumstances that impact their students' academic success. The government and the general public exert pressure on school administrators to enhance their students' academic performance in one manner or another. As a result, schools have developed a variety of performance enhancement tactics and resources, including supplemental tuition for kids who require it, reward and punishment systems for good and bad students, and forged grade competition, among others. However, menstrual hygiene and menstrual hygiene management are not included in some of the techniques and materials used by schools to improve academic achievement (Botha, 2010). There are schools in Nyeri and Kiambu that routinely do well in external and internal exams, while others constantly do badly.

Lack of clean, functional, private, and gender-specific WASH facilities in schools, fear of blood flowing, limited access to sanitary goods, and improper responses by male students and instructors have all been linked to inadequate MHM and absence due to menstruation (Tamiru, 2014). Reduced attention and involvement are also caused by fatigue and pain in class during menstruation (UNICEF, 2015). Having these faults on a regular basis might lead to low academic achievement (sommer, 2010).

2.6.1 Menstrual hygiene management and school absenteeism.

Previous studies have linked absenteeism in school to menstrual related problems. One study revealed that 43% to 50.7% of female students were absent from school (1 to 4 days) as a result of menstrual related problems (Fehr, 2011; Zegeye et al., 2009). Moreover, almost 90% of the students asserted that their school did not have a special sanitary facility solely for the female students and that contributed to 43% of them missing school when they experience menstruation (Fehr, 2011). High rates of school dropouts have also been reported in Oromia (65%) and Amhara (33%) in Ethiopia as a result of deficient separate facilities for females (Nekatibeb, 2002).

Studies have revealed that, millions of girls stay home from school owing to menstruation and poor menstrual practices which may increase their chances dropping out from school (Mathiaud, 2014). Reports from UNESCO also revealed the reasons for school absenteeism to include: inadequate menstrual materials, menstrual cramping, lack of water and sanitation facilities, and menstrual accident fears (UNESCO, 2014). Other students highlighted their poor performance in class to include: inability to stand up to speak for fear of menstrual leakage; for fear of smell and menstrual accident, most of them fear to come out in front of the class in instances of subject demonstration due to the subsequent stigma and shame associated with this (Dhakal et al., 2018; Hennegan et al., 2016).

2.6.2 Menstrual hygiene management and concentration/ participation incurriculum activities.

In addition, most females face the challenge of attending class attentively owing the problems related to menstruation including: pain, menstrual blood leakage fears due to improper sanitary napkins (Chirambo,2020). Menstrual cycle affects the education or academic performance of the girl child significantly when compared to days of free menarche. Some prior studies have revealed the possibility of menstruation being a barrier to the female education.

Furthermore, good menstrual hygiene management is very crucial to the health, dignity, empowerment and productivity of adolescent girls and women. Lack of effectiveness in menstrual hygiene may expose women to poor health and stigma which is linked to high rates of school dropouts and absenteeism (Poureslami & Osati-Ashtiani, 2002). Thus, good menstrual hygiene practices are of utmost importance to the girl child education and the society as a whole.

The girl child in Ghana in some schools complains of anxiety and fear for mensuration in schools with the absence of water, soap and sanitary facilities. The Ministry of Health in Ghana developed a policy where by sanitary materials would be kept in school for adolescent ladies yet this cannot be physically confirmed (Ribeiro, 2013).

CHAPTER THREE

RESEARCH METHODOLOGY

3.0 Introduction

This chapter is divided into two sections. The first section dealt with the geography of the study area and the second part dealt with the methodology that was employed to undertake the study.

It starts by giving a brief profile of the study area. And the second part was devoted to the study methodology employed for the study. The methodology looks at the study design, the study type, the sampling procedure, the sources of data, tools for data collection, and techniques of data analysis.

3.1 Study area

LOCATION OF STUDY AREA

This study was conducted within the Tamale metropolis, "one of the 20 districts of the Northern Region of Ghana; it is located in the central part of the Region and shares boundaries with the Sagnarigu Municipality to the west and north, Mion District to the east, East Gonja to the south and Central Gonja to the south-west" (GSS, 2010).

The Metropolis has "a total estimated land size of 646.90180sqkm. Geographically, the Metropolis lies between latitude 9º16 and 9º 34 North and longitudes 0º 36 and 0º 57 West. The tamale metro occupies about 750km sq. which is about 13% of the land referred to as the Northern region"(GSS-2021).

There are 115 communities that make up the metropolis. It is 180 meters above sea level (GSS, 2010). The land is with few hills and appears undulating and has only one rainy season in a year. The metropolis falls within the savannah woodland zone has very few water bodies. The main soil types are the sandstone, gravels, and mudstone (GSS, 2010).

POPULATION OF STUDY AREA

According to the 2021 census report, the Tamale metropolis has an estimated population of 374,744 with 185,051 males and 189,693 females with a sex ratio of 99.1 (TMA, 2021).

The proportion of the population residing within the urban areas (80.8%) are more than those residing within the rural areas (19.1%). The metropolis has a sex ratio of 99.1. the population of the metropolis is youthful with 36.4% being below 15years, which illustrates a broad base for the population pyramid. A perfect population pyramid is formed with 5.1% being elderly. The district has 64.4 dependency ratio with the rural settlements showing a higher dependency ratio (86.5) than the urban areas (65.7).The population is cosmopolitan with different ethnic and tribal groups such as Dagombas, Gonjas, Mamprusis, Dagaabas, Nanumbas, Konkombas, Asante's, Ewes, and Hausas among others. The metropolis began experiencing a high growthin population after the increase in migration from other ethnic groups to settle, hence upgrading it intoa cosmopolitan area.

MAP OF STUDY AREA

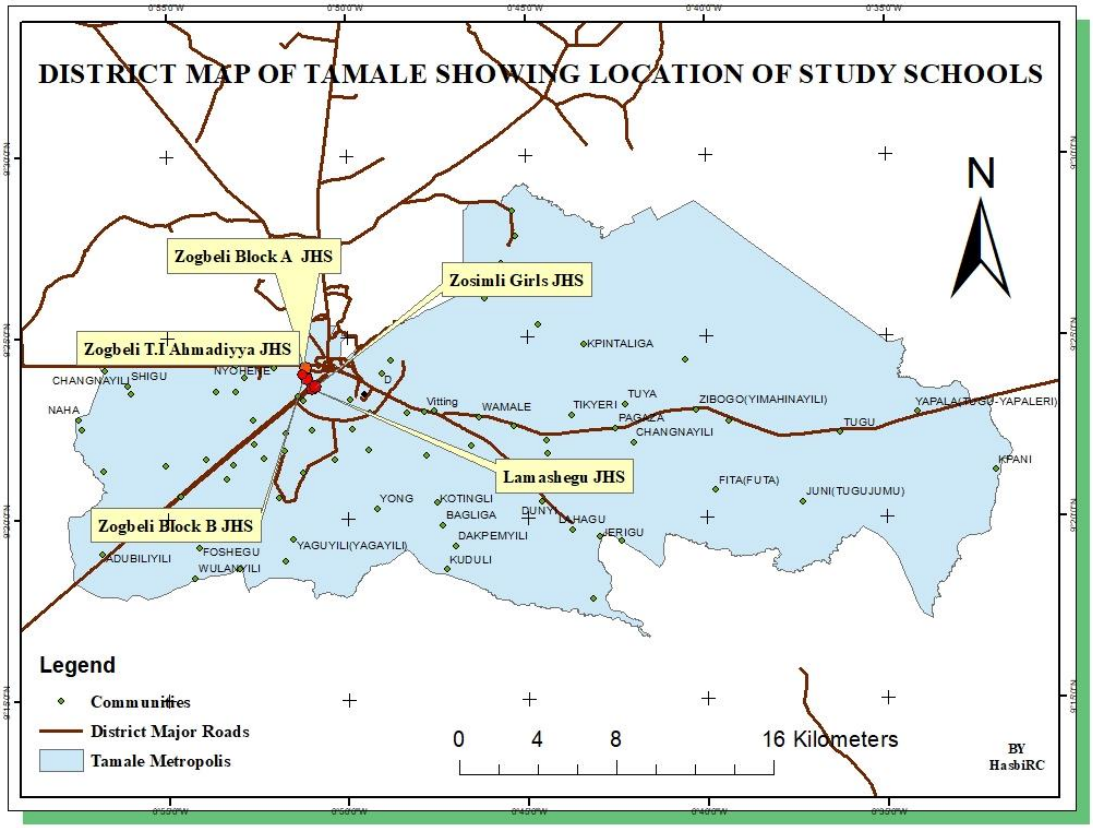

Figure 3.1; Map of Tamale Metropolis

EDUCATION IN THE STUDY AREA

There are 742 schools in the district, including 14 senior high schools, 94 kindergartens, 304 elementary schools, and 112 junior high schools.

Literacy rates in the city are at 60.1 percent, with 39.9 percent of the population being illiterate. The percentage of males who are literate (69.2%) is greater than the percentage of females who are literate (51.1 percent). At least five out of ten respondents (54.8%) claim they can speak and write fluently in both English and at least one Ghanaian language. In the metropolis, children aged 3 and above (84,897) are now enrolled in school. Males account for 52.9 percent of the total, while females account for 45.1

percent.Males account for 58.6% of individuals who have attended school at some point in the past, while females account for 41.4 percent. This demonstrates that boys have always had a larger proportion of those who have dropped out of school and those who are still in school. 15.1 percent of the population is in nursery, 18.2 percent in JSS/JHS, 12.5 percent in SSS/SHS, and 40.0 percent of the population is in primary school, with 5.7 percent of the population now attending postsecondary schools.

TOPOGRAPHY OF STUDY AREA

The tamale metropolis is found 180 meters above sea level. The topography is rolling with some few hills that do not inhibit physical movement and development. There are also shallow valleys that sometimes serve as streams(TMA, 2021).

VEGETATION OF STUDY AREA

The area falls within the Savannah woodland zone that is the Guinea Savannah belt of the Northern region of Ghana. The metropolis has drought resistant grass and trees spread across its reserves, egg: Sheanut tree, Mahogany and the Dawadawa tree. The metropolis is noted for its preserved natural forests and tall grasses that mostly consist of drought resistant species (ESMF, 2010).

SANITATION OF STUDY AREA

Indiscriminate disposal of refuse is a major practice in most of the rural communities in the district; however, in the district capital public dumping sites are the most adopted. About 72.5% of urban households have a dustbin which is periodically collected to the

dumpsite whiles only 27.5% of rural households got themselves a dustbin. A large percentage of households throw their liquid waste onto the streets or in a gutter, 72% urban households and 27% rural households.

The mechanized water supply system is not regular and hence inadequate to meet the needs of the increasing population in the town.

TRADITIONAL POLITICAL SYSTEM

The Metropolitan is led by the Metropolitan Chief Executive, who is selected by the government on a political basis. The numerous communities in the Metropolis are led by a total of 59 Assembly members, 18 of whom are appointed by the community and 41 of whom are elected by the community. The metropolis has a total of 205 unit committee members. Subsidiary-Committees exist in the District Assembly, and its members work hard to help the assembly accomplish its objectives and aims. In order to establish a strong community presence, a taskforce group known as the "BILCHINSI" was formed to aid in the implementation of the assembly's decisions and to maintain discipline among the Metropolis' youngApart from this Local Government system, there are paramount traditional chiefs and sub chiefs who help the assembly in fostering peace, stability, and development in the metropolis through traditional governance. Traditionally, the Yaa Naa is the metropolis's overlord, but he enskins the Gukpegu Naa as his subject over the Metropolis's traditional administration.

OCCCUPATIONALDISTRIBUTION

Service rendering and sales employment account for 33.0% of the people that are employed. Art and craft, as well as allied trades, account for 21.5 percent of the total. A

total of 17.6 percent of the employed population is trained in cattle, agriculture, forestry, and fishing. Professional workers account for 8.1 percent of the employed population.

Boys and girls aged 15 and above are self-employed without employees (60.6 percent), employees under employers (19.5 percent), contributing family workers (5.9%), and self-employed with employees (6.9%).Females are self-employed at a larger rate than men in the city, with 70.5 percent engaged in petty commerce without workers, compared to 51.3 percent for males who are self-employed without employees. When compared to males in this group, the percentage of females who work for other companies is small (11.3 percent) (28.2 percent). The tamale metropolis' informal private sector is the largest, accounting for 83.2 percent of the working population. The public sector employs 11.3 percent of the workforce(GSS, 2010).

DIVISION OF THE TAMALE METROPOLIS

The metropolis is divided into two sub metros namely, the Tamale central sub-metro and the tamale south sub- metro.

Tamale central sub-metro

The central sub metro as the name connote is located in the heart of the town. It is the CBD (Central Business District of the town. All financial institutions in the metro are located I the tamale central and most of the businesses in the metro are also located in tamale central. Most of the health institutions such as the tamale west hospital, northern regional hospital, SDA hospital, are all located in the tamale central sub- metro.

Tamale south sub-metro

The Tamale south sub-metro is in the sub-urban area, mostly located in the periphery of the metro. Most of the communities in the sub metro are rural in nature and majority of its inhabitants are engaged in subsistence and commercial farming, including rearing of animals.

The economic status of the population in the Tamale metropolis is not all that expensive as majority of the residents involved in petty trading and farming. Whiles the men are mostly farmers, the women contribute by selling of the produce. Thus, more men are employed compared to women. Picorna and Lamashegu markets are functional markets in the Tamale Metropolis. It should be however noted that there are other smaller markets in the communities.

3.2 Study design

This study adopted the descriptive cross-sectional design which measures exposures and outcomes simultaneously among persons taking part in the study. A descriptive cross-sectional survey was utilized because a cross-sectional study is a form of observational study that involves the examination of data gathered from a population, or a representative subset, at one specific moment in time in medical and social science research (Schmidt & Kohlmann, 2008). This study also employed the mixed method approach where both quantitative and qualitative data are explored. This has become necessary because issues of menstruations and associated issues are often treated as a taboo in the study setting with most adolescents not showing interest in such discussions. The mixed study will allow the researcher to gather more data from the adolescents. Also,

the demerits of the qualitative studies are often augmented by the quantitative study and the vice versa; by using the mixed method therefore the limitations on the use of one approached could be reduced if not eliminated.

3.3 **Study population**

This study covered allJunior High School (JHS) girls in selected school in the Tamale Metropolis. This study population was selected because their ages fall within the ages of menarche and early stages of menstruation.

3.4 Inclusion and exclusion criteria

3.4.1 Inclusion criteria

The criteria for inclusion into this study included all adolescent girls;

1. Who are JHS students and residents in the Tamale metropolis

2. Who have had their first menses at the time of this study

3. Who are not pregnant or considering to be pregnant.

4. Who are mentally and physiologically sound, and

5. Have voluntarily consented to participant in this study.

3.4.2Exclusion criteria

On the other hand, the exclusion criteria include all adolescent girls;

1. Who were not in JHS

2. Who were not resident in Tamale Metropolis

3. Who are pregnant or considering to be pregnant

4. Who are not mentally sound

5. Who have not seen their first menses at the time of the study and

6. Who refuse to voluntarily consent to participate in this study.

3.5 Variables

The variables under the consideration of this study include; academic performance, menstrual hygiene tools, menstrual hygiene facilities and some social aspects of menstrual hygiene in schools. Academic performance is the independent factor with menstrual hygiene, management/practices and tools being the dependent factors. Demographic characteristics will also be measured.

3.6 Sample size determination

This calculation of the sample size for the quantitative data was based on Yamane's formula for calculating sample size of a known population. Yamane (1973) depicts the formula as

$$n = \frac{N}{1+N(e^2)}$$

where, n= sample size

N= population size = population of girls currently attending JHS according to the latest census = 12,221

e= margin of error =0.05

95% confidence interval

$$n = \frac{12,221}{1+12,221\ (0.05^2)}$$

n = 387.3 approximately 388

Therefor sample size n = 388. Thus, the minimum sample size required to be representative in this study is estimated as 388.

On the other hand, a total of forty-four (44) adolescent girls were recruited for the qualitative data. This number was attained after the saturation point was reached. The saturation point in qualitative research is the point where a further interview of the study participants does not add up any new information except for repeating information that has been captured by previous study participants.

3.7Sampling technique and procedure

The study employed the multistage sampling. Firstly, the study area was classified into two strata (i.e., Tamale central and south metro). Using the simple random sampling, the Tamale central metro was selected. In the Tamale central metro, five (5) were chosen at random. To do this, all JHS were written on small pieces of paper and folded nicely. The papers were then placed in a basket and shake well to avoid selection bias. Thereafter, five (5) little students were made to pick one paper each. In the end all the schools that were written on these papers were then selected. To ensure that equal representation was made from these schools, the sample size was divided equally; with each of the five schools getting 78 respondents.

Using the systematic sampling technique, the sample units were recruited. To do this, the school health coordinator of each school was tasked to obtain the list of all students who have had their first menses. Depending on the list generated in the school, the sample frame is determined to aid in the selection of the sample units.

On the other hand, the study participants in the qualitative were using the consecutive sampling. These participants were recruited in the Tamale south metro. This decision was reached because all participants in the quantitative level were in the Tamale central metro. The Tamale central and south metro have similar characteristics. The students who consent to participate in this study and had made themselves available at the time of the study were considered into the focus group discussions.

3.8 Sources of data

Data for this study was sourced from both primary and secondary sources.

Primary data is the type of data that is collected from source by the researcher for the research whereas secondary data is the type of data that are already collected from primary sources and made available for researchers to use for their research purposes.

Primary data was gathered through observation, interviews, focus group discussions and answers from respondents. Secondary data was sourced from the school'slibrary, the regional educational office, articles and the internet.

3.9 Data collection tools

The data collection methods were the structured questionnaire and Focus group discussions.

3.9.1 Questionnaire

Questionnaires were used to gather information from participants. This questionnaire was structured after reviewing related literature on the subject. Thereafter, the questionnaire was shared with colleagues, seniors and some senior lecturers with considerable expertise on the subject matter to do face validations. Thereafter, the supervisor also made valuable contributions to improve on the data collection tool. All inputs at each stage of the consultation were affected in the final questionnaire before the data collection started. In the questionnaire design were open-ended and close-ended questions which covered the level of knowledge of participants on menstrual hygiene management and the type of practices they are involved is the management of their menstrual hygiene. Questions were also posed to analyse the relationship between their ongoing menstrual hygiene management tools and practices and its effects on the variables of their academic performance. The questionnaire was structured in accordance to the specific objectives of the study. For each of the school visited, the students were given a questionnaire. To ensure that the appropriate responses were obtained, three ladies offering BSc. Nursing and Midwifery were trained on the data collection tool. These ladies assisted with the data collection by reading the questions and in some instance translating the questionnaire to Dagbani for the students to understand so as to provide an answer. Each questionnaire administration lasted between 15 to 25 minutes.

3.9.2 Focus group discussion (FGDs)

Focus group discussions were used as the method for the collection of qualitative data amongst the female students in the selected schools to aid substantive collection of data required for the study. The focal group discussions interview guide was structured in accordance with the specific objectives of the study. The questions were mainly open ended. This allows the researchers to ask follow up questions to augment the quantitative data. In all, four focus group discussions were held within the school outside school hours. In each focus group discussion, eight (8) people participated. The school hours were not use because the girls could have miss out of some crucial contact hours. The adolescents were engaged in friendly conservations to calm their nerves and also to familiarize ourselves. Prior to the interviews, the students' consents were sought and the voices recorded for safe keeping. Also, during the interviews, the researcher noted some key points on a paper. The researcher also moderated the interview to allow all girls to contribute to the study. The interview lasted between 25 to 35 minutes.

3.10 Data analysis and presentation

The statistical package for social sciences (SPSS) software version 27 was used to code and analyze quantitative data. The data was analyzed quantitatively using descriptive and inferential statistics, with graphs and tables displaying the results. The categorical variables were compared using Chi square analysis, with a p-value of 0.05 deemed statistically significant.

On the other hand, the qualitative data was analysed using the Thematic Content Analysis (TCA). All recorded audios were transcribed verbatim. The transcripts were reviewed

together with the audio files to correct errors. Coding was done from which themes were generated. The results were presented according to themes with supporting codes.

3.11 Ethical considerations

Permission was sought from the Department of Community Health and Development for approval of the study topic before embarking on the study.

Also, permission was sought from the regional education directorate to access the schools

Headmasters and mistresses of selected schools granted the permission for the study to be conducted in their schools.

Consent was obtained from parents and/ or guardians of girls who were less than 18 years. However, for those girls who were 18 years and above, consent form was obtained from them before the study commenced. Confidentiality of data source(s) for the study was ensured by not indicating names, and using codes instead.

CHAPTER FOUR

PRESENTATION OF RESULTS

4.0 Introduction

This chapter presents the findings from this study. The data was collected among 388 adolescent girls within the Tamale Metropolis. Descriptive statistics of the socio-demographic characteristics of the participants and the study variables were presented in charts and tables whereas the qualitative data was presented with quotes to support the quantitative data.

4.1 Socio-demographic characteristics

4.1.1.*Socio-demographic characteristics of respondents for quantitative data*

From the table 4.1 below, three hundred and eighty-eight (388) respondents were recruited for this study. One hundred and eighty-six (186, 47.9%) were within the ages of≤15 years, followed by 16-18 years (174, 44.8%) and 28 (7.2%) within the ages of 19-20 years. Majority 370(95%) of the respondents were Muslims and 17(4.4%) being Christians. Three hundred and forty-seven (347, 89.4%) of the respondents were Dagombas, 25(6.4%) being Gonjas, 4(1.0%) were Frafras and twelve (12) representing 3.1% from other ethnic groups. Majority 316(81.4%) had their menarche between the 10-13 years and 72(18.6%) between 14-16 years. Most 179(46.1%) of the fathers were either senior high school graduates or higher as compared to most mothers 163(42%) being junior high school graduates. Majority of the fathers were farmers (200, 51.5%), followed by government employees (74, 19.1%) and traders (41, 10.6%) while most of the mothers

were traders (162, 41.8%), followed by farmers (134, 34.5%) and government employees (31, 8%)(Table 4.1).

Table 4.1: Socio-demographic characteristics of respondents for quantitative data

Variable	Frequency	Percentage (%)
Age		
≤ 15 years	186	47.9
16-18 years	174	44.8
19-20 years	28	7.2
Total	388	100.0
Religion		
Muslim	370	95.3
Christian	17	4.4
African Traditional	1	.3
Total	388	100.0
Ethnicity		
Dagomba	347	89.4
Gonja	25	6.4
Frafra	4	1.0
Others	12	3.1
Total	388	100.0
Age at Menarche		
10-13 years	316	81.4

14-16 years	72	18.6
Total	388	100.0
Educational level of father		
Never been to school	31	8.0
Primary School	42	10.8
Junior High School	136	35.1
Senior High School and above	179	46.1
Total	388	100.0
Educational level of mother		
Never been to school	34	8.8
Primary School	85	21.9
Junior High School	163	42.0
Senior High School and above	106	27.3
Total	388	100.0
Occupation of father		
Farmer	200	51.5
Trader	41	10.6
Artisan	28	7.2
Employee in private Organization	22	5.7
Government employee	74	19.1
Others	23	5.9
Total	388	100.0
Occupation of mother		

Farmer	134	34.5
Trader	162	41.8
Artisan	26	6.7
Employee in private Organization	7	1.8
Government employee	31	8.0
Housewife	22	5.7
Others	6	1.5
Total	388	100.0

Field Survey, 2021

4.1.2 Socio-demographic characteristics of respondents for qualitative data

The table 4.2 shows the demographic characteristics of the respondents in the focus group discussion. In all 44 adolescent girls were engaged in four focus group discussion (FGDs). Majority of respondents (56.8%) were 15 years or above and 43.2% being less than 15 years. Regarding the class of respondents, a higher proportion (40.9%) were in their final year of the Junior High School (JHS 3), 34.1% were in JHS 2 students and 34.1% being JHS 1 students. Majority of the girls (59.1%) belong to the Dagomba ethnic group whilst the remaining 40.9% belongs to other ethnic groups other than the Dagombas. Muslims (63.6%) were predominating as compared to the Christians (36.4%). (Table 4.2)

Table 4.2: Socio-demographic characteristics of respondents for qualitative data (n=44)

Variable	Frequency	Percentage
Age		
< 15 years	19	43.2
≥ 15 years	25	56.8
Class		
JHS 1	11	25
JHS 2	15	34.1
JHS 3	18	40.9
Ethnicity		
Dagomba	26	59.1
Others	18	40.9
Religion		
Islam	28	63.6
Christianity	16	36.4

Field survey, 2021

4.2 Knowledge on Menstrual Hygiene among respondents.

From the table 4.3 below, majority 364(93.8%) of the respondents have ever heard of menstruation. Menstrual hygiene is well known by the respondents as 191 representing

49.2% have heard of it and a little higher 197(50.8%) proportion of the sample size have not heard of menstrual hygiene. Major source of information on menstruation for the respondents were classroom (149, 56.7%), friends (86, 32.7%) and electronic media (26, 9.9%).

In the qualitative data, all girls have heard about menstrual hygiene from varied sources such as mothers, friends, media (radio) and teachers. For example, some students have this to say:

> *"Oooh as for menstruation my mother told me about it even before I experienced my first menses. Also, in school some of my friends were talking about" (FGD participant, JHS 3).*

> *"I have heard about menstruation. Just last month our integrated science teacher taught us about menstruation and how to care about ourselves. But my mother also informed me about menstruation" (FGD participant, JHS 1)*

Majority 297(76.5%) of the respondents have menstruated as against 91(23.5%) who have never menstruated.

This was emphasized in the FGD where respondents expressed how they were assisted and thought about menstruation in school by their teachers.

> *"I saw my first menstruation in Class 6. I was scared and started crying. So, my class teacher spotted me and came closer to ask why. After I told her, she consoled me and gave me a pad for that day and also showed me how to use those things and other stuffs"(FGD participant, JHS 2)*

Others gave testimonies of how their friends helped them:

> *"The person who helped me on the first day of my menses was my best friend in school who at that time had already started menstruating. She started giving me advice on menstrual hygiene and gave me some menstrual materials. She explained to me that it was normal as at that time I did not know anythingabout menstruation and menstrual hygiene"(FGD participant, JHS 3)*

Menstruation is not a disease as stated by majority (302, 77.8%) of the respondents as (86, 22.2%) against who said menstruation is a disease. Most (290, 74.7%) of the respondents said pregnant women do not menstruate. Menstrual blood does not contain harmful substances (229, 59%) and it is not harmful for a woman's body if she runs or dances during her period (226, 58.2%). Menstruation can cause discomfort like dizziness or tiredness (260, 67%) and can cause pain (345, 88.9%).Majority (270, 69.6%) of the respondents indicated that menstrual blood does not come from the stomach where food is digested(Table4.3)

Table 4.3: Knowledge of menstrual hygiene among study respondents (n=388)

Variables	Frequency	Percentage (%)
Heard about menstruation before		
Yes	364	93.8
No	24	6.2
Total	388	100.0
Heard of menstrual hygiene		
Yes	191	49.2
No	197	50.8
Total	388	100.0
Sources of information on menstruation		
Classroom	149	56.7
Electronic media	26	9.9
Friends	86	32.7
Print media	2	.8
Total	263	100.0
Have you menstruated		
Yes	297	76.5
No	91	23.5
Total	388	100.0
Menstruation is a disease		
Yes	86	22.2

No	302	77.8
Total	388	100.0
Pregnant women menstruate		
Yes	98	25.3
No	290	74.7
Total	388	100.0
Menstrual blood contains harmful substances		
Yes	159	41.0
No	229	59.0
Total	388	100.0
It is harmful for a woman's body if she runs or dances during her period		
Yes	162	41.8
No	226	58.2
Total	388	100.0
Menstruation can cause discomfort like dizziness or tiredness		
Yes	260	67.0
No	128	33.0
Total	388	100.0
Menstruation can cause pain		
Yes	345	88.9
No	43	11.1
Total	388	100.0

Menstrual blood comes from the stomach where food is digested		
Yes	118	30.4
No	270	69.6
Total	388	100.0

Field Survey, 2021

Overall knowledge on menstruation

Generally, 86.6% demonstrated appreciable (good) knowledge on menstruation and menstrual hygiene based on the fact that they responded correctly to the questionnaire assessing their level of awareness and knowledge related to menstruation whereas13.4% insufficient (poor) knowledge on menstruation and menstrual hygiene (figure4.1) below.

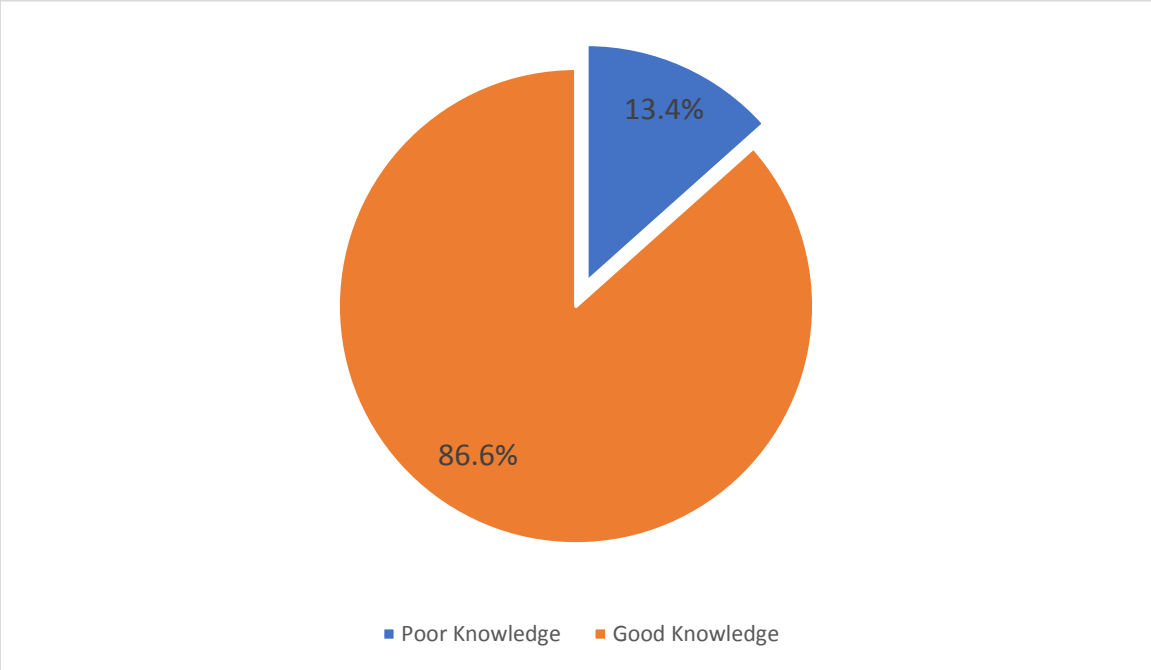

Figure 4.1:Overall knowledge on menstruation and menstrual hygiene

4.3 Menstrual hygiene practices among respondents inJunior High school

Majority (276, 90.2%) of the respondents go to school during their period. Menstrual materials that are mentioned to be used during menstruation include sanitary pad (274, 89.5%), reusable materials (19, 6.2%) and menstrual cap (11, 3.6%). Most of the respondents change their menstrual material twice (164, 53.6%) a day in school and are mostly disposed in the toilet (158, 51.6%) and dustbin (73, 23.9%). Majority (156, 51%) of respondents who have concentration problems in class during menstruation are not able to partake in all school activities during menstruation.

One of the FGD participants confirmed the discomfort associated with menstruation and how it disrupts her concentration by stating that:

> "*Menstrual pain can take days before you are relieved, and during this period if there is an exams or activity that needs your full attention and participation, you might fail it or postpone it till another time, and these opportunities don't come always, thereby making you repeating a class or revisiting everything to come back to write when you are okay" (FGD participant, JHS 1)*

Another recounted:

> *"There are times I cannot stand for practical lessons and have to go back due to cramps. Also, i could use time to study to wash a pile of stained clothes which thereafter would make you sleepy. Or i would have had to go back to the house to change because i am stained. Even If you are*

given a cardigan too to tie on your waist, you'd be so uncomfortable and alert making you lose concentration on lessons". (FGD participant, JHS 3)

Other problems faced by students when attending school during menstruation were pain during menstruation (173, 56.5%), fear of stains or smell (81, 26.5%) and feeling tired, dizzy weak unwell (47, 15.4%). Majority (181, 59.2%) of the respondents stated that there is enough time in breaks for change of menstrual item and are able to leave class to wash in case of a leak (189, 61.8). (Table 4.4 for more details)

Table 4.4: Menstrual hygiene practices among Junior HighSchool

Variable	Frequency	Percentage
Do you go to school during your period?		
Yes	276	90.2
No	30	9.8
Total	306	100.0
What type of menstrual material do you use during menstruation?		
Sanitary pads	274	89.5
Menstrual cup	11	3.6
Tampons	2	.7
Reusable materials	19	6.2
Total	306	100.0
How many times do you change your menstrual material in a day at school?		
Once	88	28.8
Twice	164	53.6
Other	54	17.6
Total	306	100.0
How do you dispose your menstrual material when in school?		
Dustbin	73	23.9
Toilet	158	51.6
Keep it in my bag until I get home	62	20.3
Other	13	4.2
Total	306	100.0
Do you have concentration problems in class during menstruation?		
Yes	150	49.0
No	156	51.0
Total	306	100.0

Are you able to partake in all school activities during menstruation?		
Yes	150	49.0
No	156	51.0
Total	306	100.0
Specify some problems you face when attending school during menstruation?		
Pain during menstruation	173	56.5
Fear of stains or smell	81	26.5
Feeling tired, dizzy weak unwell	47	15.4
Other	5	1.6
Total	306	100.0
Is there enough time in breaks for change of menstrual item?		
Yes	181	59.2
No	125	40.8
Total	306	100.0
Are you able to leave class to wash in case of a leak?		
Yes	189	61.8
No	117	38.2
Total	306	100.0

Field Survey, 2021

4.4 General concern of students towards menstrual hygiene management practice among schools

Majority of the respondents who agreed (142, 36.6%) they knew about menstruation before menarche also indicated they are able to wash their hands when they want to at school (164, 42.3%). Respondents who strongly agreed to have comfortable menstrual materials (136, 35.1%) are able equally able to change my menstrual materials whenever they want to (114, 29.4%). Most of the students strongly agree to being satisfied with the place they use to change their menstrual materials (105, 27.1%), but are worried that others would see their menstrual blood after they urinate (135, 34.8%).

Most of the students strongly agreed to be worried that their menstrual materials would allow blood to pass through to their outer garments (114, 29.4%). Majority of the respondents disagree to have enough of their menstrual materials to change them as often as they wanted to (107, 27.6%). Students who agreed to feel comfortable carrying spare menstrual materials with them outside their home (108, 27.8%) are worried about where to dispose of the used menstrual materials (101, 26.0%). Students agree to fear standing up in class to answer questions during their period (103, 26.5%) and disagree to being able to partake in extra curriculum activities during their period (110, 28.4%). Majority of the respondents strongly agreed to not being able to fully concentrate in class during their period (115, 29.6%).(See table 4.5 for more details).

Table 4.5:General concern of students towards MHM practice among schools

Statement	StronglyDisagree	Disagree	Neutral	Agree	Strongly Agree
Knew about menstruation before menarche.					
	47 (12.1%)	41 (10.6%)	35 (9.0%)	142 (36.6%)	123 (31.7%)
Wash hands when at school					
	22 (5.7%)	29 (7.5%)	22 (5.7%)	164 (42.3%)	151 (38.9%)
Menstrual materials are comfortable					
	34 (8.8%)	57 (14.7%)	37 (9.5%)	124 (32.0%)	136 (35.1%)
Able to change menstrual material at school					
	54 (13.9%)	74 (19.1%)	55 (14.2%)	91 (23.5%)	114 (29.4%)
Satisfied with the place to change menstrual materials					
	84 (21.6%)	71 (18.3%)	26 (6.7%)	102 (26.3%)	105 (27.1%)
Worry that others would see my menstrual blood					
	31 (8.0%)	70 (18.0%)	35 (9.0%)	135 (34.8%)	117 (30.2%)
Worry that I am unable to change my menstrual materials at school					
	61 (15.7%)	80 (20.6%)	46 (11.9%)	94 (24.2%)	107 (27.6%)
Worry that my uniform could be soiled with blood					
	68 (17.5%)	61 (15.7%)	33 (8.5%)	112 (28.9%)	114 (29.4%)
Have enough menstrual materials to change when needed					
	60 (15.5%)	107 (27.6%)	51 (13.1%)	83 (21.4%)	87 (22.4%)
Feel comfortable carrying spare menstrual materials when going outside					
	62 (16.0%)	92 (23.7%)	31 (8.0%)	108 (27.8%)	95 (24.5%)

Worried about where to dispose of my used menstrual materials				
68 (17.5%)	83 (21.4%)	35 (9.0%)	101 (26.0%)	101 (26.0%)
Fear standing up in class to answer questions during my period				
69 (17.8%)	87 (22.4%)	37 (9.5%)	103 (26.5%)	92 (23.7%)
Able to partake in extra curriculum activities during my period				
87 (22.4%)	110 (28.4%)	36 (9.3%)	89 (22.9%)	66 (17.0%)
Able to fully concentrate in class during my period				
50 (12.9%)	83 (21.4%)	30 (7.7%)	110 (28.4%)	115 (29.6%)

Field Survey, 2021

4.5 Relationship between Socio-Demographic Characteristics and Knowledge Level of Respondents

Respondents 16-18 years (90.8%) answered majority of the questions assessing knowledge right as compared the other age groups that answered some basic questions wrong. (p-value JHS 3 students who are seniors and must have probably menstruated for some few months also proved to be more knowledgeable (94.6%) as compared to those in JHS one and two. Muslims were already the majority group of the study and they also are the group with a high level of knowledge (87.0%) during the study. Dagombas equally showed more knowledge (86.7 %) as compared to respondents belonging to other ethnic groups. Students who fathers had a higher level of education, that is, SHS and above, showed a high level of knowledge (86.6%) in answering the questionnaire as compared to those whose fathers never attended school or attended up to JHS. Even though students with their mothers having SHS and above as their educational level scored lower marks in answering the questionnaire, those with mothers that have up to JHS level of education were the majority (87.7%). Respondents with their fathers being farmers showed a higher level of knowledge (86.0%) unlike those with their fathers being government employees (90.5%) and private organization employees (86.4%). However, respondents with their mothers being traders showed a higher level of knowledge (87.7%) (Table 4.6).

Table 4.6: Relationship between Socio-Demographic Characteristics and Knowledge Level of menstruation among respondents

Socio-demographic	Overall knowledge score		Total	Statistical test
	Poor	Good		
Age				χ^2=4.84;
8-15 years	31 (16.7%)	155 (83.3%)	186	p=0.09
16-18 years	16 (9.2%)	158 (90.8%)	174	
19-20 years	5 (17.9%)	23 (82.1%)	28	
Gender				χ^2=0.51;
Male	1 (20.0%)	4 (80.0%)	5	p=0.21
Female	50 (13.1%)	332 (86.8%)	387	
Form/class				*χ^2=18.25;*
JHS 1	30 (21.9%)	107 (78.1%)	137	***p<0.001***
JHS 2	13 (15.7%)	70 (84.3%)	83	
JHS 3	9 (5.4%)	159 (94.6%)	168	
Religion				***χ^2=6.78;***
Muslim	48 (13.0%)	322 (87.0%)	370	***p=0.03***
Christianity	3 (17.6%)	14 (82.4%)	17	
African Traditional	1 (100.0%)	0 (0.0%)	1	
Ethnicity				χ^2=1.83;
Dagomba	46 (13.3%)	301 (86.7%)	347	p=061
Gonja	5 (20.0%)	20 (80.0%)	25	

Frafra	0 (0.0%)	4 (100.0%)	4	
Others	1 (8.3%)	11 (91.7%)	12	
Age at menarche				χ^2=0.81;
10-13 years	40 (12.7%)	276 (87.3%)	316	p=0.34
14-16 years	12 (16.7%)	60 (83.3%)	72	
Educational level of father				χ^2=0.90;
Never been to school	5 (16.1%)	26 (83.9%)	31	p=0.83
Primary School and below	7 (16.7%)	35 (83.3%)	42	
Junior High School	16 (11.8%)	120 (88.2%)	136	
Senior High School and above	24 (13.4%)	155 (86.6%)	179	
Educational level of mother				χ^2=0.95;
Never been to school	4 (11.8%)	30 (88.2%)	34	p=0.81
Primary School and below	14 (16.5%)	71 (83.5%)	85	
Junior High School	20 (12.3%)	143 (87.7%)	163	
Senior High School and above	14 (13.2%)	92 (86.8%)	106	
Occupation of father				χ^2=2.55;
Farmer	28 (14.0%)	172 (86.0%)	200	p=0.77
Trader	8 (19.5%)	33 (80.5%)	41	
Artisan	3 (10.7%)	25 (89.3%)	28	
Employee in private Organization	3 (13.6%)	19 (86.4%)	22	
Government employee	7 (9.5%)	67 (90.5%)	74	
Others	3 (13.0%)	20 (87.0%)	23	

Total				
Occupation of mother				χ^2=11.09; p=0.09
Farmer	16 (11.9%)	118 (88.1%)	134	
Trader	20 (12.3%)	142 (87.7%)	162	
Artisan	6 (23.1%)	20 (76.9%)	26	
Employee in private Organization	3 (42.9%)	4 (57.1%)	7	
Government employee	6 (19.4%)	25 (80.6%)	31	
Others	0 (0.0%)	6 (100.0%)	6	

Field Survey, 2021

4.6 Effect of menstrual hygiene practices on the academic performance of JHS girl.

During the focus group discussion, a participant recounted:

> *"I once had to go back to the house to change because i was stained and because of the distance from my house to the school, I couldn't return for that day's lesson. Even If you are given a cardigan to tie on your waist, you'd still be so uncomfortable and alert making you lose concentration on lessons". (FGD participant, JHS 3)*

A FGD participant lamented her experience:

> *"Menstrual pain can take days before you are relieved, and during this period if there is an exams or activity that needs your full attention and participation, you might fail it or postpone it till another time, and these opportunities don't come always, thereby making you repeating a class or revisiting everything to come back to write when you are okay. With hygiene management you can always be in charge and it may take no much time, while moods and pains need more time to adjust." (FGD participant, JHS 3)*

The responses given by three (3) participants also suggest that teachers were not playing the pivotal role of disseminating information on the subject matter. The behaviour of some teachers in responding to MHM issues further scares the girls from participating in class for fear of being exposed and being laughed at.

"… We were taught about menstruation in school, however, our teacher is shy, and so anytime he is teaching menstruation he does not mention some words to us. He would just say 'the thing'…" (FGD participant, JHS 2)

During the Focus group discussion, two girls gave testimonies on how menstruation related issues cause them to absent themselves for a number of days.

". Any time I am having my menses for the first 4days I have to stay home. Right from my menarche to JHS. Till date for the first 4 days, I am indisposed. I can hardly get out of bed because the cramps are severe. (FGD participant, JHS3)".

Another testified that:

"There are times I cannot stand for practical lessons and have to go back home for days due to menstrual cramps."- (FGD participant, JHS2)

The behaviour of some teachers compels some girls to neither ask nor answer questions in class for the fear of being vilified by colleagues and teachers.

"…. For our teacher, when you ask questions and even mention vagina or penis, he would just be laughing at you. Then everybody would be looking at you like a bad girl…. Because of that, sometimes if you have a question to ask, you cannot do so. You have to go home and ask your mother, and or resort to friends…" (FGD participant, JHS 1)

The attitudes of male counterparts towards the girls also scare them from asking questions on menstruation in class but rather resort to other friends.

"…Hmmmm, master it is true oooh. Even the boys in the class would be calling you names if you dare ask questions about menstruation. So, for me just my friends…" (FGD participant, JHS 2)

Five (5) participants are unable to participate in class activities when they are experiencing their menstrual flow for fear that their male counterparts may make fun of them.

"…I feel very uncomfortable when am menstruating whilst in class. If by mistake, the boys in my class see the flow (the menstrual blood) or hear that you are menstruating, they would make fun of you, until you just leave the class. They would block their noses, while passing unpalatable comments like the class is smelly as a result of the menstrual flow, while laughing at you. …" (FGD participant, JHS 3)

Four (4) of the participants are not able to associate themselves and so isolate from the rest of their peers.

"…For me, when it happens that way, I cannot even talk in class. I do not also want to involve in any form of activity and playing with my peers for fear that, I may be exposed or get a leak. Hmmm, I just sit like am sick whilst praying that, I would get the least chance to go to the bush, urinal or toilet and change or to seek for permission to go and change at home…." (FGD participant, JHS 2)

Some of the teachers would require that, you stand when you need to answer or ask a question. This lowers the self-confidence among the menstruating girls and prevents contributions in class.

> *"...our teachers do not like you sitting whilst answering questions in class. This may further expose you if your uniform is soiled. To prevent this, you may just choose to take permission and go home to avoid your teacher saying you do not respect. In addition, for me I do not want to even contribute or ask questions since that would further expose you…" (FGD participant, JHS 2)*

The focus group discussion had many of them shared their experiences with full participation during days of menstruation:

> *""I remember very well in the year 2 second term, during one of our exams I was having a very serious cramp. It was mild from the beginning so I was just so uncomfortable in my seat even though a teacher got me paracetamol, I couldn't write the exam and slept throughout the time". (FGD participant: JHS 3)*

CHAPTER FIVE

DISCUSSION

5.0 Introduction

This chapter includes a discussion of the findings based on a review of the literature from other studies. The discussion has been divided into different sections based on the study's objectives.

5.1 Demography of respondents

Majority of the respondents had menstruated and had previously attended school in those conditions, as well as be in the position that demanded that they deal with menstruation, menstrual hygiene whiles battling with their academic work.

5.1 Knowledge on Menstrual Hygiene

5.1.1 Awareness of menstruation and menstrual hygiene practices

The majority of the respondents (93.8 percent) have heard of menstruation, with only a small percentage of the sample size unfamiliar with menstrual hygiene. This is in contrast to the findings of UNICEF's WaterAid (2013) study, which found that one out of every three girls in South Asia knew nothing about menstruation before menarche, and that 48 percent of Iranian girls and 10% of Indian girls believed menstruation was a disease. In this survey, the majority of respondents (77.8%) answered that menstruation is not a sickness, compared to 22.2 percent who stated that menstruation is a disease. In addition, a South African research found that 27% of participants had prior knowledge of the physical changes associated with menarche (Ramathuba 2015).This is consistent with the findings of this research as 93.8% of the participants had fair knowledge about

mensesand its related body changes.The study further reveals that most of the participants had good knowledge about menstruation even though a little above half of them had limited or never heard of the word menstrual hygiene. Even though theyengage in most menstrual hygiene practices, suchashand washing after changing their menstrual materials, bathing regularly and keeping themselves, their environment and their sanitary materials clean, they simply did consider these as menstrual hygiene or menstrual hygiene practices. Despite this interesting finding, there was still a gap in knowledge regarding the origin (the source of the blood) during menstruationand the cause of menstruation (the reason why menstruation occurs in girls)Most (74.7%) of the respondents said pregnant women do not menstruate indicating a good level of knowledge. Menstrual blood does not contain harmful substances (59%) and it is not harmful for a woman's body if she runs or dances during her period (58.2%). Menstruation can cause discomfort like dizziness or tiredness (67%) and can cause pain (88.9%), indicating a progressive level of knowledge regarding menstruation and general knowledge regarding it, which is contrary to the findings of a study done in Southern Ethiopia and Nigeria where (60.1%) showed low perceptions of menstruation [Tangchai et al., 2004].

Majority (69.6%) of the respondents indicated that menstrual blood does not come from the stomach where food is digested.Additionally, participants rightly answered that menstruation cause pain and discomfort such as dizziness and tiredness.

These findings are having a close relation with what was previously reported in Urban Nigeria where the increase in the possession of good knowledge score could be attributed to the advancement in education and diverse accessible sources of credible information

like the media and other relevant sources (Oche et al., 2012).These findings, however, contrast those of a research that found 71.3 percent of female students lacked understanding about their menstruation [Shanbhag, 2012]. The assessment methodologies each research employed to gauge the degree of knowledge and the socio-cultural diversity of study participants might be one explanation for the variance in results.

However, 23% of the participants indicated that menstruation is a disease with about 25% of them believing wrongly that pregnant women menstruate. A prior study conducted in rural and urban Uganda found a similar result indicating some misconceptions among adolescent girls that menstruation was a disease (UNESCO, 2014). Moreover, some of the participants (31%) indicated that menstrual blood comes from the stomach where the food is digested. The reason for this misconception is not clear but it could be due to poor explanation by teachers or poor communication between parents and their children regarding menstruation. This finding further confirms participant's poor knowledge concerning the origin of menstruation. Inadequate knowledge on menstruation and MHM played a role as an important and independent predictor of poor MHM among participants in this study, which can lead to poor academic performance.

Moreover, majority of girls (91%) reported the vagina as the organ responsible for menstruation. In the first place, the right response to question is the uterus. The high error rate could be attributed to the fact that most young adolescents have poor knowledge of the physiology of menstruation. They mistake blood pouring out of the vaginal opening for the source. This is corroborated by a research conducted in Nepal, which found that the majority of people had no idea where their menstrual blood comes from (Mahon et al., 2010). Similar to this conclusion, a research in Pakistan (Michael et al., 2020)

revealed that 60.2 percent of females thought menstrual blood came from the vaginal canal. On the other hand, in the urban slum areas of India, only 16% of adolescent girls knew that menstrual blood was from the uterus, this finding is about twice higher than the 8% reported in this study. In Southern Ethiopia, 32.6% of girls mentioned uterus as the source of menstrual blood (Belayney et al., 2020) and 29.3% of girls in Pakistan also knew the correct source of blood being the uterus (Mansoor et al., 2020).

5.1.2 Sources of information on menstruation

This study also aimed to assess the girls' source of information regarding menstruation in other to ascertain the quality of the information they possess about menstruation and menstrual hygiene. It was revealed that majority of the participants learned about menstruation in the classroom with some of them too learning from their friends. The use of electronic/print media and family were the least used by participants in terms of getting their source of information about menstruation, 9.4% and 4.3% respectively. This could be due the reason being that students at this level are not permitted to use electronic gadgets in almost all Ghanaian institutions. Another reason could be the difficulty associated with having access to both the electronic media and print media. Also, most parents and families shy away from discussing menstruation and other related adolescent reproductive lifestyles with adolescent girls because they fear they will make their children wayward, which could also be the reason for the low score for family as a source of information in this study. This conclusion is consistent with Seekoe (2005), who argues that moms lack sexuality skills and are uncomfortable discussing sex with their daughters, hence this obligation falls to the instructor. This might also explain why classroom teachings are regarded as the most reliable source of knowledge on

menstruation. Furthermore, more than half of those polled got menstrual information prior to their first period. According to the survey, some of the girls acquired information from their parents (mothers).These similarities could be explained by the fact that mothers are usually close to the female child and are able to detect the signs of menstruation early to implement interventions that include education on menses, its significance, and how it should be managed. According to Gora et al. (2020), it is the grandmother or mother's obligation to pass on knowledge about menses to their daughters in various cultures. In India, Pradeepkumar et al. (2019), Middle and East Africa, Middle and East Africa, Middle and East Africa, Middle and East Africa, Middle and East Africa, Middle and East Africa, Middle and East Africa, Middle and East Africa, Regarding the source of information, Roudi et al. (2011) had a different point of view. The majority of adolescent females learned about menstruation through their instructors and peers, according to one survey. Teachers in the current research, on the other hand, believe that knowledge gained from friends is frequently based on hearsay and is thus unscientific.

5.2 Menstrual Hygiene Practices and Academic Performance

5.2.1 Type of Absorbents used

About 99% of girls in the sample used some sort of absorbent material during their period. This finding was noted to be higher than that of a study done in Ethiopia by Belayneh et al. (2019) which revealed that 66.1% of study respondents used some form of absorbent materials and slightly higher than 82.2% reported in western Ethiopia by Upashe et al. (2015). The level of knowledge in the current study is higher that from the studies mentioned above, which could account for the wide range in discrepancy between the two. Menstruating girls have a primary need to feel clean and dry always. Absorbent materials are important in providing this dryness, cleanliness and comfort. On the question of preference of menstrual material, about 88.1% of the participants chose sanitary pads and almost 12% indicated they use other materials even though they will prefer using disposable pads. This is in contrast to the findings of a study conducted by

Anee et al., (2020) indicated about 51.5% adolescent girls were using sanitary napkins as menstrual absorbent, while 45.6% were using used cloths. In this study, menstrual cups, tampons and reusable materials were mentioned as substitute to sanitary pads, but a negligible percentage of the participants opted for them even as substitutes. Lower socioeconomic class, rural domicile, lack of access to accurate knowledge about menstruation, and a lack of funds to purchase sanitary goods for menstrual hygiene were

all factors in why some of them continued to use dangerous materials. During the mid-1990s, studies in rural Bangladesh and India indicated that the majority of teenage females used worn pieces of fabric or no protection at all during menstruation (Kaur et al., 2018). In more recent investigations and research, this looks to be changing for the better. In one of the recent studies in India, it was observed that younger women are more likely to use sanitary pads during menstruation (Anee et al., 2020). The current finding is inconsistent with the findings of the research conducted in Mali and Ethiopia where the participants engaged in using poor absorbent materials including rags, cloth and old cotton fabric. Notably, when girls use proper sanitary pads or absorbent materials, it may ameliorate discomfort, protect against leakages and stains and infections as well. Specifically, the study found that most of the girls used commercial sanitary pads. The findings of the current study on the usage of sanitary pads were lower than that of the 98.6% recorded in Egypt (El Meselhy et al., 2020), 93.8% and 83% recorded in tow studies in Nepal (Neupane 2020) and (Pokhrel et al., 2020) respectively, and 67.2% and 64.3% recorded in Nigeria (Gorah et al., 2020) and (Adika et al., 2011), 66.9% recorded in Kenya (Mathenge et al., 2020), 86.1% recorded in north India (Sharma et al,. 2013). The finding of this current study is however higher than that of 47.2% recorded in rural Ghana (Mohammed et al,. 2020) and 21.2% recorded in the Yendi Municipality in Northern Ghana (Boakye 2018). In the present study, the study participants were only schoolgirls unlike those conducted in Ghana earlier which recruited all categories of the adolescent girls in school and out of school. Also, the belief of these girls differs and hence could be a reason for differences in the data presented above. In another study, the second most absorbent material used was cloth (28.8%). These findings are lower than

57% in Northern Ghana (Ayl et al., 2010) and similar to 26.9% in Nigeria (Okafor et al., 2017). Contrary to the above, Chandra et al, (2017) and Kuhlmann (2017) in systematic research showed a majority of girls in lower and middle-income countries (LMIC) tend to use a cloth to absorb menstrual blood during menstruation. However, studies conducted in Bangladesh by Anee et al. (2020) and in India by Pradeepkumar et al. (2019) presented findings which were directly opposite to the finding of this study. These studies revealed that the majority of the respondents used a disposable sanitary pad to absorb menstrual blood during their menses. The girls in these studies believed that sanitary pads were easy to use and as such make them comfortable. This was supported by Wiesemann et al. (2011) who opined that sanitary pad handle different densities of menses under a variety of conditions and activities, easy to use, comfortable, and easy to dispose of. The socio-economic status and socio-cultural factors (myths, taboos, parent's occupation, and educational level, etc.) could be attributed to the differences in the findings of these studies about sanitary materials.

5.2.2 Changing of Menstrual Material

More to the above, about 50.8% of the participants change their sanitary materials twice daily, this is slightly lower than what was reported in Senegal where close to 55% of the respondents changed their sanitary materials at least thrice a day (WSSCC and UN Women, 2014). Studies have shown that, when a girls fails to change the pads consistently it can increase the chances of the growth of bacteria in the vagina (Alberda, 2018). A study conducted in India revealed that consistently changing of the menstrual absorbent materials prevented the growth of bacteria in the vagina (Torondel et al., 2018). Perhaps, the inability to regularly change the sanitary materials could be attributed to

lower socioeconomic backgrounds of the participants in this study, as the affordability of sanitary materials come with cost. Changing pads regularly and not washing hands with soap and clean water before and after changing MHM materials were the most commonly deduced poor MHM practices in this study. It was established somewhere that the more comfortable students are with the toilet facilities, the more likely they are to use the place and therefore the more likely they are to change their menstrual material whiles in school which makes them comfortable in school and increases the probability of them attending schools, participating in activities and being active in class on days they are menstruating. As a result, lack of acceptable and economical period hygiene supplies, poor design of school WASH facilities, or shame associated with changing menstruation materials at school can all be blamed for not changing menstrual pads on a regular basis (Busari, 2010). More study is needed to investigate these connections in detail. While the causes of irregular pad change and inappropriate or no hand washing in our research group need to be investigated further, several intervention studies show that educational interventions can help improve the usage and frequent replacement of various absorbent materials. Busari (2010) found that community-targeted and message-specific interventions based on psychosocial theory can have a favorable impact on hand washing when given in a culturally acceptable and context-specific way (Abrahams et al., 2006).

Most of the participants in this study indicated that they had challenges changing their menstrual materials in the frequency they prefer to. This could be due to the problems associated with the place where they change their menstrual materials. According to UNESCO (2014), one out of every ten African girls misses school due to menstruation, resulting in a higher school dropout rate and poor academic performance (Snvworld,

2013). Menstruating teenage females, according to Mohammed (2020), demand sanitary facilities that are private and tailored to their needs. It's also been stated that almost half of girls feel comfortable attending to school during menstruation; just 14% said they felt uncomfortable, and these were largely from schools without running water or privacy in the restrooms. It's worth noting that the number of people who are comfortable, those who are only occasionally comfortable, and those who are not comfortable is almost the same.Meanwhile, close to half of them also indicated that they have worries about others seeing their menstrual blood after urinating due to the lack of privacy in the urinals, and some worry about menstrual blood passing through their outer garment. All these contribute to absenteeism, lack of interest in schooling on days of menstruation, lack of concentration in class which in the long run affects the academic performance of girls.

5.2.3 Handwashing

In curbing the spread of the corona virus, the Government of Ghana and other Non-governmental Organizations have supported in providing veronica buckets and other hand washing materials for schools in the country. Even schools that were not provided with these facilities had to find their ways of getting some for the safety of their staff and their students against the deadly virus. This changed the narrative about hand washing in the schools that participated in the study. Almost all the students answered YES when asked if they wash their hands anytime they visit the toilet facility. Irrespective of what they go to do at the toilet, being it the changing of menstrual material or any other thing, they have the hand washing apparatus available to wash their hands and maintain purity. However, the position of these hand washing facilities are such that students can use

them to wash their hands and not stained clothing or menstrual materials, and that was challenging to them. Even though students could keep clean from germs, but the facility was not tackling menstrual hygiene related cleanliness as that was not the main goal of the set up.

The existence of facilities or equipment alone is unlikely to stably enhance hygiene habits (Roma, 2012), implying that other elements are as important in influencing hand washing behavior and, as a result, how it helps to enhancing MHM practices.

5.3 Menstrual Hygiene Management in school and Academic Performance

5.3.1 Absenteeism due to menstruation and Academic Performance.

Studies on absenteeism and its relationship to educational success are not routinely collected in Ghana making it hard to assess the impact of absenteeism due to menstrual hygiene and other factors affecting education and academic performance. However, based on Global studies by Jarrah& Kamel, (2012) it is reported that absenteeism due to menstruation can be related to poorer education and academic performance among school going girls and for this study, Ghanaian girls. Reports have indicatedover one in ten girls at least absent themselves from school due to menstruation associated concerns especially hygiene tools and practices; meanwhile this assertion differed widely with place of stay.

Even though, what has been reported in Africa is slightly not consistent with this, it is still worth noting to consider (Mutunda, 2013). Confirming the above outcomes, the current study showed that only 53.5% are able to concentrate in class during their menses, this is very worrying as it could have a great negative impact in their academic performances.

Missing out on what is being taught will also make the students nervous and worried as well. Our study also showed that, menstrual related school absenteeism, lack of full participation in curriculum and extra curriculum activities, and lack of active involvement in classroom lessons was common among few of the respondents of this study which is in contrary to similar researches in Uganda by Montgomery (2010) and in Ethiopia by Tegegne & Sisay, 2014) yet similar with what was reported in Indonesia (Kennedy, W. Suriastini, 2015), Bangladesh (Alam et al., 2017) and South Africa (Kgware, 2016).

5.3.2 Participation in Curriculum and Extra Curriculum Activities and Academic performance.

The study also found out that almost half of the girls who could attend school whiles menstruating encountered several challenges which is contrary to the results of a study conducted in rural and urban Uganda where the majority of the respondents (75% urban and 86% rural), responded that menstruation does not affect their studies. In addition, about 27% of them also worry about where to dispose of menstrual materials and the majority of them also feel shy to stand up in class to answer questions during menstruating. About half of the participants in this study were reported to abstain from all school activities and were having concentration problems in class during their menstrual period.

The study revealed during exams period some girls miss out of exams due to menstruation. This is not far from other studies conducted previously with same objectives in some low- and middle-income countries. A study conducted previously in Nepal found that most of the girls do not sit in front of the class nor would raise up their hands to respond to questions {Formatting Citation}. The most plausible reasons as stated

earlier could be due to the pain, worries of staining cloth, and worries of friends teasing her, worries of where to change menstrual material and where to dispose of used absorbent materials which are associated with menstruation (Hennegan et al., 2016; Torondel et al., 2018)

Furthermore, only 47% partake in school activities in the said condition and 87% go to school during menstruation. Most of them complained of pain (54%) and fear of smell or staining their clothing (26%), this clearly shows that a lot more needs to be done to tackle the concerns most of them raise. Other studies have also stated the scantiness in evidence in dealing with pain and its impact on academic performance is still scanty (Busari, 2012). Providing comprehensive sexual and reproductive health education programs that focus on knowledge and practical skills related to menstruation and MHM, specifically pain management, may aid in reducing absenteeism and lack of concentration or participation, particularly in extracurricular activities, caused by menstrual pain.

Furthermore, it was revealed in this study that certain subjects taught in the schools include menstrual hygiene as part of the curriculum (i.e., social studies, integrated science). It's worth noting that pre-menstruation education is included in the much-needed progress of female education at the lower levels of school. In many nations, there is a global growth in girls' education, with improved holding and grade advancement for females (Haver & Long, 2015). Despite the fact that MHM is included in the curriculum, it was discovered that not all instructors are familiar with MH education and that no MHM teaching resources are accessible in schools. Most females stated that some teachers were not receptive to addressing menstruation concerns in class, and that boys were apprehensive when the matter was brought up. The teacher's timidity in connection

to the issue has an influence on the adolescent girls since they are afraid of being mocked if they ask questions. This conclusion is consistent with the findings of a similar study performed in India, which found that boys' opinions about girls who are menstruation hinder them from engaging in class (Mason et al., 2017).

CHAPTER SIX

SUMMARY, CONCLUSION AND RECOMMENDATIONS

6.1 Summary of findings

A total of three hundred and eighty-eight (388) respondents were recruited for this study. Out of which one hundred and eighty-six (186, 47.9%) were within the ages of≤15 years. Majority 370(95%) of the respondents were Muslims and 17(4.4%) being Christians. Three hundred and forty-seven (347, 89.4%) of the respondents were Dagombas. In all 44 adolescent girls were engaged in four focus group discussion (FGDs). Majority of respondents (56.8%) were 15 years or above and 43.2% being less than 15 years. Muslims (63.6%) were predominating as compared to the Christians (36.4%).

Majority 364(93.8%) of the respondents have ever heard of menstruation. Menstrual hygiene is well known by the respondents as 191 representing 49.2% have heard of it and a little higher 197(50.8%) proportion of the sample size have not heard of menstrual hygiene. Major source of information on menstruation for the respondents were classroom (149, 56.7%), friends (86, 32.7%) and electronic media (26, 9.9%). In the qualitative data, all girls have heard about menstrual hygiene from varied sources such as mothers, friends, media (radio) and teachers. Some respondents in the qualitative data said they were taught about menstruation in school by their teachers. Menstruation is not a disease as stated by majority (302, 77.8%) of the respondents as (86, 22.2%) against who said menstruation is a disease. Most (290, 74.7%) of the respondents said pregnant women do not menstruate.

Majority (276, 90.2%) of the respondents go to school during their period. Menstrual materials that are mentioned to be used during menstruation include sanitary pad (274, 89.5%), reusable materials (19, 6.2%) and menstrual cap (11, 3.6%). Majority (156, 51%) of respondents who have concentration problems in class during menstruation are not able to partake in all school activities during menstruation.

Other problems faced by students when attending school during menstruation were pain during menstruation (173, 56.5%), fear of stains or smell (81, 26.5%) and feeling tired, dizzy weak unwell (47, 15.4%). Majority (181, 59.2%) of the respondents stated that there is enough time in breaks for change of menstrual item and are able to leave class to wash in case of a leak (189, 61.8). Most of these were corroborated by the qualitative data.

The study established significant association between knowledge about menstruation and form/class ($p<0.001$) and Religion ($p=0.03$).

Majority of the respondents who agreed (142, 36.6%) they knew about menstruation before menarche. Respondents who strongly agreed to have comfortable menstrual materials (136, 35.1%). Most of the students strongly agree to being satisfied with the place they use to change their menstrual materials (105, 27.1%). Students who agreed to feel comfortable carrying spare menstrual materials with them outside their home (108, 27.8%) are worried about where to dispose of the used menstrual materials (101, 26.0%).

The responses given by three (3) participants also suggest that teachers were not playing the pivotal role of disseminating information on the subject matter. The behavior of some teachers in responding to MHM issues further scares the girls from participating in class

for fear of being exposed and being laughed at. During the Focus group discussion, two girls gave testimonies on how menstruation related issues cause them to absent themselves for a number of days. The behaviour of some teachers compels some girls to neither ask nor answer questions in class for the fear of being vilified by colleagues and teachers.The attitudes of male counterparts towards the girls also scare them from asking questions on menstruation in class but rather resort to other friends. Some students are unable to participate in class activities when they are experiencing their menstrual flow for fear that their male counterparts may make fun of them. Some of the teachers would require that, you stand when you need to answer or ask a question. This lowers the self-confidence among the menstruating girls and prevents contributions in class.

6.2 Conclusion

The study revealed that, close to half of the sampled participants (45.6%) were having appreciably good knowledge about menstruation and menstrual hygiene practices. Also, the study found that majority of the participants learned about menstruation in the classroom with most them too with friends. About 13.1% of the participants reported menstrual related school absenteeism. The study found out that many of the girls who attend schools while menstruating encounters several challenges including the place where they can change their menstrual materials and fears of colleagues teasing them, fears of menstrual blood staining their cloth. About half of the participants in this study were reported to abstain from all school activities and were having concentration problems in class during their menstrual period.

6.3Recommendation

The study makes some number of recommendations to improve menstrual hygiene practices.

1. The Ministry of Education together with its agency (Ghana Education service) should adopt the menstrual hygiene practices guidelines documented by the UNICEF and WHO to enable adolescent girls practice good MHM in schools.
2. School teachers should be trained in other to provide students especially adolescent girls with the sufficient informationabout menstruation, menstrual hygiene and how students can balance menstrual hygiene management to avoid negative effects on their academic performance.
3. School authorities should improve places where the girls change their sanitary pads during menstruation and parents should be encouraged to support the schools and the girls in times of menstruation by donation of sanitary pads, potable water and other important sanitary materials.
4. The role of the media and non-governmental organizations (such as women's associations and health focused organizations) could champion the education of menstrual hygiene to dispel the growing myths and misconception about menstruation in the Northern Ghana.
5. The government should waive taxes off sanitary pads to make them always available at prices that are affordable to school going girls from low economic status families.

REFERENCES

Abdel-Hady El-Gilany, Karima Badawi & Sanaa El-Fedawy (2005) Menstrual Hygiene among Adolescent Schoolgirls in Mansoura, Egypt, Reproductive Health Matters, 13:26, 147-152, DOI: 10.1016/S0968-8080(05)26191-8

Abrahams, N., Mathews, S. and Ramela, P. 2006. Intersections of 'sanitation, sexual coercion and girls' safety in schools'. Tropical Medicine & International

Adam, R., Schnetz, B., Mathey, P., Pericoi, M., & De Prost, Y. (2009). Clinical demonstration of skin mildness and suitability for sensitive infant skin of a new baby wipe. Pediatric Dermatology, 26(5), 506–513.

Adhikari, P., Kadel, B., Dhungel, S. I., & Mandal, A. (2007). Knowledge and practice regarding menstrual hygiene in rural adolescent girls of Nepal. Kathmandu University Medical Journal, 5(19), 382–386.

Adika, V. O., Yabga, J., Apiyanteide, F. A., Ologidi, P. W., & Ekpo, K. E. (2011). Perception and behaviour on use of sanitary pads during menstruation among adolescent school girls in Bayelsa State, Nigeria. Advances in Applied Science Research, 2(6), 9-15.

Adinma ED, Adinma J. Perceptions and practices on menstruation amongst Nigerian secondary school girls. Afr J Reprod Health. 2008;12(1):74–83

Alam, M.-U., Luby, S. P., Halder, A. K., Islam, K., Opel, A., Shoab, A. K., Ghosh, P. K., Rahman, M., Mahon, T., & Unicomb, L. (2017). Menstrual hygiene management among Bangladeshi adolescent schoolgirls and risk factors affecting school absence: results from a cross-sectional survey. BMJ Open, 7(7), e015508.

Alberda, H. (2018). Menstrual Health: Training Manual. The Netherlands.

Ali TS, Rizvi SN. Menstrual knowledge and practices of female adolescents in urban Karachi, Pakistan. Journal of Adolescents 2010;33(4):531–41.

Allah, E. S. A., & Elsabagh, E. M. (2011). Impact of health education intervention on knowledge and practice about menstruation among female secondary school students in Zagazig city. The Journal of American Science, 7, 737–747.

AlQuaiz, A. M., Tayel, S. A., & Habib, F. A. (2013). Assessment of symptoms of menopause and their severity among Saudi women in Riyadh. Annals of Saudi Medicine, 33(1), 63-67.

Aluko, O. O., Oluya, O. M., Olaleye, O. A., Olajuyin, A. A., Olabintan, T. F., & Oloruntoba-Oju, O. I. (2014). Knowledge and menstrual hygiene practices among adolescents in senior secondary schools in Ile Ife, south-western Nigeria. Journal of Water, Sanitation and Hygiene for Development, 4(2), 248–256.

Ameade, E. P. K., & Garti, H. A. (2016). Relationship between Female University Students' Knowledge on Menstruation and Their Menstrual Hygiene Practices: A Study in Tamale, Ghana. Advances in Preventive Medicine, 2016, 1–10. https://doi.org/10.1155/2016/1056235

and their impacts on sanitation systems: Examples from eThekwini Municipality (Oral presentation). Available on http://www.ewisa.co.za/literature/files/

Anee, U. S., Islam, A., Wahid, F., & Ahmed, K. (2020). Knowledge, attitude and practice on female Hygiene management among Madrasa girls in Dhaka, Bangladesh. Asian Journal of Multidisciplinary Studies, 3(1), 110-116.

Aniebue, U., Aniebue, P., & Nwankwo, T. (2010). The impact of pre-menarcheal training on menstrual practices and hygiene of Nigerian school girls. Pan African Medical Journal, 2(1). https://doi.org/10.4314/pamj.v2i1.51708

Aryani, I., Rachma, U. P., Rokhayati, E., & Moelyo, A. G. (2018). Menstrual cycle patterns of Indonesian adolescents. Paediatrica Indonesiana, 58(3), 101–105. https://doi.org/10.14238/pi58.3.2018.101-5

Asimah, S. A., Diabene, P. Y., & Wellington, S. N. L. (2017). Menstrual hygiene management in Ghana: Understanding the socio-cultural, economic, political factors, challenges and opportunities. Proceedings of the 40th WEDC International Conference, Loughborough, UK, 24–28.

available on http://www.ijastnet.com/journals/Vol_2_No_4_April_2012/20.pdf accessed 9 April 2016

Ayalew, M., Mengistie, B., & Semahegn, A. (2014). Adolescent-parent communication on sexual and reproductive health issues among high school students in Dire Dawa, Eastern Ethiopia: a cross sectional study. Reproductive health, 11(1), 1-8.

Ayi I, Nonaka D, Adjovu JK, Hanafusa S, Jimba M, Bosompem KM, et al. School-based participatory health education for malaria control in Ghana: engaging children as health messengers. Malar J. 2010;9(1):98.

Bauer, H. (1997). High poverty, high performing: High hope! IDRA Newsletter, 24(6). Retrieved from http://www.idra.org/Newslttr/ 1997/Jun/Hilaria.htm

Belayneh Z, Mekuriaw B. Knowledge and menstrual hygiene practice among adolescent school girls in southern Ethiopia: A cross-sectional study. BMC Public Health. 2019;19(1):1595.

Boakye-Yiadom A, Aladago DA, Beweleyir J, Mohammed HB, Salifu MF, Asaarik M. Assessing the Knowledge, Attitude and Practice of Menstrual Hygiene Management Among Junior High Schools Adolescent Females in the Yendi Municipality in the Northern Region of Ghana. Eur Sci Journal, ESJ. 2018;14(36):467.

Boosey, R., Prestwich, G., & Deave, T. (2014). Menstrual hygiene management amongst schoolgirls in the Rukungiri district of Uganda and the impact on their education: A cross-sectional study. Pan African Medical Journal, 19. http://doi.org/10.11604/pamj.2014.19.253.5313

Brawner, B. M., Sommers, M. S., Moore, K., Aka-James, R., Zink, T., Brown, K. M., & Fargo, J. D. (2016). Exploring genitoanal injury and HIV risk among women: menstrual phase, hormonal birth control, and injury frequency and prevalence. Journal of Acquired Immune Deficiency Syndromes (1999), 71(2), 207.

Busari, A.O. 2012. Menstrual Knowledge and Health Care behavior among Adolescent Girls in Rural, Nigeria

Chandra-Mouli V, Patel SV. Mapping the knowledge and understanding of menarche, menstrual hygiene and menstrual health among adolescent girls in low- and middleincome countries. Reprod Health 2017: 14: 30.

Chandra-Mouli, V., & Patel, S. V. (2017). Mapping the knowledge and understanding of menarche, menstrual hygiene and menstrual health among adolescent girls in low-and middle-income countries. Reproductive Health, 14(1), 30.

Chin, L. (2014). Period of shame-The effects of menstrual hygiene management on rural women and girls' quality of life in Savannakhet, Laos.

Chirambo, T. (2020). An exploration of menstruation hygiene management among high school learners: the case of Fezeka High School, Gugulethu (Master's thesis, Faculty of Humanities).

Crosta, P. (2015). What Is Ovulation? What Is The Ovulation Calendar? http://www.medicalnewstoday.com/articles/150870.php

Dasgupta A, Sarkar M. Menstrual hygiene: how hygienic is the adolescent girl? Indian Journal of Community Medicine 2008;33(2):77–80.

Dasgupta, A., & Sarkar, M. (2008). Menstrual hygiene: how hygienic is the adolescent girl?. Indian journal of community medicine: official publication of Indian Association of Preventive & Social Medicine, 33(2), 77.

Davis, J. (2018). Menstrual hygiene management and school absenteeism among adolescent students in Indonesia. Tropical Medicine and International Health, 23 (12), 1-doi:10.1111/tmi.13159

De Sanctis, V., Soliman, A. T., Soliman, N. A., Elalaily, R., & Millimaggi, G. (2015). Shortened menstrual cycles (Hypomenorrhea) in two adolescents: Diagnostic and reproductive implications. Rivista Italiana Di Medicina Dell'Adolescenza, 13(1).

Deo D, Ghataraj DC. Perceptions and practices regarding menstruation: a comparative study in urban and rural adolescent girls. Indian Journal of Community Medicine 2005;30:33–34.

Dewhurst, C. J., Cowell, C. A., & Barrie, L. C. (1971). The regularity of early menstrual cycles. BJOG: An International Journal of Obstetrics & Gynaecology, 78(12), 1093–1095.

Dhakal, S. B., Sah, N., Shrestha, S., & Ahmad, T. (2018). Analysis of menstrual hygiene practices in Nepal: the role of WASH in Schools programme for girls' education.

Dhakal, S. B., Sah, N., Shrestha, S., & Ahmad, T. (2018). Analysis of menstrual hygiene practices in Nepal: the role of WASH in Schools programme for girls' education.

El Meselhy HM, Salama AA, El Mawardy SR. Menstrual hygiene among secondary school students. Menoufia Med J. 2020;33(1):24.

El-Gilany A, Khalil A, Shady I. KAP of adolescent schoolgirls about menstruation in Mansoura, Egypt. Bulletin of High Institute of Public Health 2004;34(2):377–96

El-Hameed, N. A. A. Mohamed, M. S. Ahmed, N. H. Ahmed, E. R. (2011). Assessment of dysmenorrhea and menstrual hygiene practices among adolescent girls in some nursing schools at El-Minia Governorate, Egypt. The Journal of American Science; 2011, 7(9), 216–223. http://www.americanscience.org

Elledge, M. F., Muralidharan, A., Parker, A., Ravndal, K. T., Siddiqui, M., Toolaram, A. P., & Woodward, K. P. (2018). Menstrual hygiene management and waste disposal in low and middle income countries—a review of the literature. International Journal of Environmental Research and Public Health, 15(11), 2562.

Emmanuel, B., & Yawson, A. (2019). MENSTRUAL HYGIENE MANAGEMENT AND RESOURCES FOR ADOLESCENT GIRLS IN AN URBAN SETTING IN ACCRA, GHANA. Postgraduate Medical Journal of Ghana.

ESMF (2010), Environmental and Social Management Framework for proposed construction of 10 regional innovation centers: Ghana, May 2010.

Fakhri M, Hamzehgardeshi Z, Golchin NAH, Komili A. Promoting menstrual health among Persian adolescent girls from low socioeconomic backgrounds: a quasi-experimental study. BMC Public Health. 2012;12(1):193

Garba, I., Rabiu, A., & Abubakar, I. S. (2018). Menstrual hygiene among adolescent school girls in Kano. Tropical Journal of Obstetrics and Gynaecology, 35(2), 153–157.

Geertz A, Iyer L, Kasen P, Mazzola F, Peterson K. An Opportunity to Address Menstrual Health and Gender Equity. FSG: Boston, MA, USA, 2016.

Ghana Statistical Service (GSS), "2010 population & housing census. District analytical report: tamale metro," Accra, Ghana, 2014, https://www.statsghana.gov.gh/docfiles/2010_ District Report/Northern/tamale metro.pdf%0A%0A.

Gorah KY, Haruna EA, Ufwil JJ. Knowledge, Attitudes and Practices of Menstrual Hygiene Management of Female Students in Bokkos Local Government Area of Plateau State; Nigeria. KIU J Soc Sci. 2020;6(1):365–74.

Gorah, K. Y., Haruna, E. A., & Ufwil, J. J. (2020). Knowledge, Attitudes and Practices of Menstrual Hygiene Management of Female Students in Bokkos Local Government Area of Plateau State; Nigeria. KIU Journal of Social Sciences, 6(1), 365–374.

Grant, M., Lloyd, C., & Mensch, B. (2013). Menstruation and school absenteeism: evidence from rural Malawi. Comparative education review, 57(2), 260-284.

Gumanga, S. K., & Kwame-Aryee, R. A. (2012). Menstrual characteristics in some adolescent girls in Accra, Ghana. Ghana Medical Journal, 46(1).

Gupta, A. (2014). Design of an absorbent and comfortable sanitary napkin for applications in developing countries. Massachusetts Institute of Technology.

Haver, J., & Long, J. L. (2015). Menstrual Hygiene Management: Operational Guidelines. Save the Children. Health, 11: 751–756. doi: 10.1111/j.1365-3156.2006.01600.xHealth, 14(1), 1–14.

Hennegan, J., Dolan, C., Wu, M., Scott, L., & Montgomery, P. (2016). Schoolgirls' experience and appraisal of menstrual absorbents in rural Uganda: a cross-sectional evaluation of reusable sanitary pads. Reproductive Health, 13(1), 143.

House S, Mahon T, Cavill S. Menstrual hygiene matters: a resource for improving menstrual hygiene around the world. Reprod Health Matters. 2013;21(41):257–9.

House, S., Mahon, T., & Cavill, S. (2012). A resource for improving menstrual hygiene around the world. Menstrual Hygiene Matters, Water Aid, London, UK.

Jabbour, H. N., Kelly, R. W., Fraser, H. M., & Critchley, H. O. D. (2006). Endocrine regulation of menstruation. Endocrine Reviews, 27(1), 17–46.

Jarrah, S. S., & Kamel, A. A. (2012). Attitudes and practices of school- aged girls towards menstruation. International Journal of Nursing Practice, 18(3), 308-315.

Jewitt, S., & Ryley, H. (2014). It'sa girl thing: Menstruation, school attendance, spatial mobility and wider gender inequalities in Kenya. Geoforum, 56, 137-147.

JUAYIRE, C. A. (2016). KNOWLEDGE OF OVULATORY CYCLE AND CURRENT FERTILITY AMONG WOMEN IN GHANA. UNIVERSITY OF GHANA, LEGON.

Kaplowitz, P. (2006). Pubertal development in girls: secular trends. Current Opinion in Obstetrics and Gynecology, 18(5), 487–491.

Kaur, R., Kaur, K., & Kaur, R. (2018). Menstrual hygiene, management, and waste disposal: Practices and challenges faced by girls/women of developing countries. Journal of Environmental and Public Health, 2018.

Kennedy, W. Suriastini, A. M. (2015). No Title E. Menstrual hygiene management in Indonesia: understanding practices, determinants, and impacts among adolescent school girls," Indonesia, 2015, https://www.burnet.edu.au/system/asset/file/2034/2015_Menstrual_hygiene_management_Indonesia_ FINAL_.

Kgware, M. (2016). Menstruation and menstrual hygiene management in selected kwazulu-natal schools. Oxfam Australia.

Kirk, J. and Sommer, M. 2006. Menstruation and Body Awareness: Linking Girls' Health with Girls' Education. Royal Tropical Institute (KIT), Special on Gender and Health, pp. 1-22

Konlan, L. L. (2020). ASSESSING THE IMPACT OF MENSTRUAL HYGIENE MANAGEMENT ON THE HEALTH AND SCHOOL ATTENDANCE OF ADOLESCENT GIRLS IN JUNIOR HIGH SCHOOLS IN THE KUMBUNGU DISTRICT OF THE NORTHERN REGION OF GHANA (Doctoral dissertation).

Kuhlmann A.S., Henry K., & Wall L.L. 2017: 'Menstrual Hygiene Management in Resource-Poor Countries.' Obstetrical and Gynaecological Survey 72.6, pp. 356 – 376.

Kumbeni, M. T., Otupiri, E., & Ziba, F. A. (2020). Menstrual hygiene among adolescent girls in junior high schools in rural northern Ghana. The Pan African Medical Journal, 37.

Lahme, A. M., Stern, R., & Cooper, D. (2018). Factors impacting on menstrual hygiene and their implications for health promotion. Global Health Promotion, 25(1), 54–62.

Lawan, U. M., Yusuf, N. W., & Musa, A. B. (2010). Menstruation and menstrual hygiene amongst adolescent school girls in Kano, Northwestern Nigeria. African Journal of Reproductive Health, 14(3), 201–207.

Lee PA. (1996). Normal Pubertal Development. Chapter 5 - In: Goldfarb AF (ed). Clinical Problems in Pediatric and Adolescent Gynecology. New York: Chapman & Hall, 49-60.

Mahon, T. and Fernandes, M. 2010. Menstrual hygiene in South Asia: A neglected issue for WASH (water, sanitation and hygiene) p

Mahon, T., & Fernandes, M. (2010). Menstrual hygiene in South Asia: a neglected issue for WASH (water, sanitation and hygiene) programmes. Gender & Development, 18(1), 99–113. https://doi.org/10.1080/13552071003600083

Mansoor H, Salman M, Asif N, Mustafa ZU, Nawaz AS, Mohsin J, et al. Menstrual knowledge and practices of Pakistani girls: A multicenter, cross-sectional study. Heliyon. 2020;6(1): e03157.

Maria Enzler, D. (2018). Knowledge, attitudes and practices concerning Menstrual Hygiene Management (MHM) of adolescents in rural primary schools in Malawi. (vol.1), 1-5. Malawi: Barcelona institute for global health.

Mason, L., Sivakami, M., Thakur, H., Kakade, N., Beauman, A., Alexander, K. T., van Eijke, A. M., Laserson, K. F., Thakkar, M. B., & Phillips-Howard, P. A. (2017). 'We do not know': a qualitative study exploring boys' perceptions of menstruation in India. Reproductive Health, 14(1), 174.

Mathenge MW, Midigo R. Still Grappling with Menstrual Hygiene: Explaining Uptake by Socio-Cultural Factors Among School Going Girls in Kenya. J Obs Gynecol Surg. 2020;1(1):1–6.

Mathiaud, C. (2014). Menstrual Hygiene Matters: Menstrual Hygiene Insecurity (MHI) and the need for a global recognition of adequate Menstrual Hygiene Management (MHM) as a fundamental right for all women and girls.

McMahon, S. A., Winch, P. J., Caruso, B. A., Obure, A. F., Ogutu, E. A., Ochari, I. A., & Rheingans, R. D. (2011). 'The girl with her period is the one to hang her head'Reflections on menstrual management among schoolgirls in rural Kenya. BMC International Health and Human Rights, 11(1), 7.

Menstrual Health Hub. [cited 2019 Aug 16]. Available from: https://mhhub.org/.

Michael J, Iqbal Q, Haider S, Khalid A, Haque N, Ishaq R, et al. Knowledge and practice of adolescent females about menstruation and menstruation hygiene visiting a public healthcare institute of Quetta, Pakistan. BMC Womens Health. 2020;20(1):1–8.

Miiro, G., Rutakumwa, R., Nakiyingi-Miiro, J., Nakuya, K., Musoke, S., Namakula, J., ... & Weiss, H. A. (2018). Menstrual health and school absenteeism among adolescent girls in Uganda (MENISCUS): a feasibility study. BMC women's health, 18(1), 1-13.

Moawed S. Indigenous practices of Saudi girls in Riyadh during their menstrual period. Eastern Mediterranean Health Journal 2001;7(1/2):197–203.

Mohammed S, Larsen-Reindorf RE, Awal I. Menstrual Hygiene Management and School Absenteeism among Adolescents in Ghana: Results from a School-Based Cross-Sectional Study in a Rural Community. Int J Reprod Med. 2020;2020.

Montgomery, P., Ryus, C. R., Dolan, C. S., Dopson, S., & Scott, L. M. (2012). Sanitary Pad Interventions for Girls' Education in Ghana: A Pilot Study. PLoS ONE, 7(10), 1–7. http://doi.org/10.1371/journal.pone.0048274

Mtawali, G., Pina, M., Angle, M., & Murphy, C. (1997). The menstrual cycle and its relation to contraceptive methods: A reference for reproductive health trainers.

Nair, M. K. C., Chacko, D. S., Darwin, M. R., Padma, K., George, B., & Russell, P. S. (2012). Menstrual disorders and menstrual hygiene practices in higher secondary school girls. The Indian Journal of Pediatrics, 79(1), 74–78.

Nekatibeb, T. (2002). Low participation of female students in primary education. Addis Ababa, Ethiopia: A case study of dropouts from the Amhara and Oromia regions in Ethiopia.

Neupane, M. S., Sharma, K., Bista, A. P., Subedi, S., & Lamichhane, S. (2020). Knowledge on menstruation and menstrual hygiene practices among adolescent girls of selected schools, Chitwan. Journal of Chitwan Medical College, 10(1), 69–73.

Nooh, A. M. (2015). Menstrual disorders among Zagazig University Students, Zagazig, Egypt. Middle East Fertility Society Journal. https://doi.org/10.1016/j.mefs.2014.08.002

Oche, M. O., Umar, A. S., Gana, G. J., & Ango, J. T. (2012). Menstrual health: the unmet needs of adolescent girls' in Sokoto, Nigeria. Sci Res Essays, 7(3), 410–418.

Oche, M. O., Umar, A. S., Gana, G. J., & Ango, J. T. (2012). Menstrual health: the unmet needs of adolescent girls in Sokoto, Nigeria. Scientific Research and Essays, 7(3), 410–418.

Oduor, C. A.-H. (2015, October). Schoolgirls' expeperiences of changing and disposal of menstrual hygiene items and inferences for WASH in schools. Waterlines, 34(4), 397-411.

Okafor-Terver IS, Chuemchit M. Knowledge, Belief and Practice of Menstrual Hygiene Management among in-School Adolescents in Katsina State, Nigeria. J Heal Res. 2017;31(Suppl. 2): S179-187.

Omindawre S, Begum K. Factors which influence the hygienic practices during menses among girls from south India: A cross sectional study. International Journal of Collaborative Research on Internal Medicine and Public Health 2010; 2:411-423

Osonuga, A., & Ekor, M. (2018). The impact of dysmenorrhea on activities of Ghanaian undergraduate students. Tropical Journal of Obstetrics and Gynaecology. https://doi.org/10.4103/tjog.tjog_27_18

Oster, E., and Thornton, R. 2010. Menstruation, Sanitary Products and School Attendance: Evidence from a Randomized Evaluation. American Economic Journal: Applied Economics, pp. 1-13.

Parker, A. H., Smith, J. A., Verdemato, T., Cooke, J., Webster, J., & Carter, R. C. (2014). Menstrual management: A Neglected Aspect of Hygiene Interventions. Disaster Prevention and Management, 23(4), 437- 454. Retrieved from http://dx.doi.org/10.1108/DPM-04-2013-0070

Philomena, N. (2010). 2010 population and housing census, District Analytical Report. 1-10. Tamale: Ghana Statistical Service.

Pokhrel B, Mahat S, Parajuli K. Knowledge and Practice regarding Menstrual Hygiene among Physically Disabled Women in Kathmandu, Nepal. J Karnali Acad Heal Sci. 2020;3(1):1–10.

Poureslami M, Osati-Ashtiani F. Assessing knowledge, attitudes, and behavior of adolescent girls in suburban districts of Tehran about dysmenorrhea and menstrual hygiene. J Int Women's Stud. 2002;3(2):51–61.

Pradeepkumar B, Narayana G, Chinthaginjala H, Ramalingam P, Sudheer A, Veerabhadrappa K V, et al. Impact of pharmacist mediated educational program on knowledge and practice of menstrual hygiene among adolescent girls. Int J Res Pharm Sci. 2019;10(4):3083–8.

Pradeepkumar, B., Narayana, G., Chinthaginjala, H., Ramalingam, P., Sudheer, A., Veerabhadrappa, K. V, & Vijayajyothi, M. (2019). Impact of pharmacist mediated educational program on knowledge and practice of menstrual hygiene among adolescent girls. International Journal of Research in Pharmaceutical Sciences, 10(4), 3083–3088.

Rademaker M. Allergic contact dermatitis to a sanitary pad. Australas J Dermatol. 2004;45(4):234–5.

Ramathuba, D. U. (2015). Menstrual knowledge and practices of female adolescents in Vhembe district, Limpopo Province, South Africa. curationis, 38(1), 1-6.

Rigon, F., De Sanctis, V., Bernasconi, S., Bianchin, L., Bona, G., Bozzola, M., Buzi, F., Radetti, G., Tatò, L., & Tonini, G. (2012). Menstrual pattern and menstrual disorders among adolescents: an update of the Italian data. Italian Journal of Pediatrics, 38(1), 38.

Roma E, OkemA, Norins J, Wilmouth R, Buckley C1, Hoffman V.2012. Methodologies to measure acceptability of menstrual management products

Ross, L. D. (2014). Reproductive function in the female. Clinical Biochemistry E-Book: Metabolic and Clinical Aspects, 433.

Roudi-Fahimi F, El-Feki S. Facts of life: Youth sexuality and reproductive health in the Middle East and North Africa. Population Reference Bureau Washington, DC; 2011.

Seekoe, E. (2005). Reproductive health needs and the reproductive health behaviour of the youth in Mangaung in the Free State province: a feasibility study. Curationis, 28(3), 20-30.

Shanbhag D, Shilpa R, D'Souza N, Josephine P, Singh J, Goud B. Perceptions regarding menstruation and practices during menstrual cycles among high school going adolescent girls in resource limited settings around Bangalore city, Karnataka, India. Int J Collaborative Res Intern Med Public Health. 2012;4(7):1353.

Sharma N, Sharma P, Sharma N, Wavare RR, Gautam B, Sharma M. A cross sectional study of knowledge, attitude and practices of menstrual hygiene among medical students in north India. J Phytopharm. 2013;2(5):28–37.

Singh AJ. The place of menstruation in the reproductive lives of women of rural north India. Indian Journal of Community Medicine 2006; 31(1):10-14

Snvworld 2013. Keeping girls in school with improved menstrual hygiene management. Available on http://www.snvworld.org/en/regions/africa/news/keeping-girls-in-school-with-improved-menstrualhygiene management. Accessed 13-06-2015

Sommer M, Caruso BA, Sahin M, Calderon T, Cavill S, Mahon T, et al. A time for global action: addressing girls' menstrual hygiene management needs in schools. PLoS Med. 2016;13(2):e1001962.

Sommer M, Vasquez E, Worthington N, Sahin M. WASH in schools empowers girls' education: proceedings of the menstrual hygiene management in schools. United Nations' Children's Fund, Columbia University. 2013. 2013.

Sommer, M. (2010). Where the education system and women's bodies collide: The social and health impact of girls' experiences of menstruation and schooling in Tanzania. Journal of Adolescence, 33(4), 521–529. http://doi.org/10.1016/j.adolescence.2009.03.008

Sperroff L, Glass RH, K. N. (1999). Abnormal puberty and growth problem. In: Clinical gynaecologic endocrinology and infertility. Philadelphia: Lippincott Williams and Wilkins, 381-420.

Stevenson, A., Joolay, Y., Levetan, C., Price, C., & Tooke, L. (2021). A comparison of the accuracy of various methods of postnatal gestational age estimation; including ballard score, foot length, vascularity of the anterior lens, last menstrual period and also a clinician's non-structured assessment. Journal of Tropical Pediatrics, 67(1), fmaa113.

Sunay, D., Kaya, E., & Ergun, Y. (2011). Vaginal douching behavior of women and relationship among vaginal douching and vaginal discharge and demographic factors. Journal of Turkish Society of Obstetrics and Gynecology, 8(4), 264–271.

Tamiru S. Girls in Control: Compiled Findings from Studies on Menstrual Hygiene Management of Schoolgirls. SNV Netherlands Development Organisation: Addis Abbaba, Ethiopia, 2014.

Tangchai, K., Titapant, V., & Boriboonhirunsarn, D. (2004). Dysmenorrhea in Thai adolescents: prevalence, impact and knowledge of treatment. Journal-medical association of thailand, 87, S69-S73.

Tegegne, T. K., & Sisay, M. M. (2014). Menstrual hygiene management and school absenteeism among female adolescent students in Northeast Ethiopia. BMC Public Health, 14(1), 1–14.

Thakre, S. B., Thakre, S. S., Reddy, M., Rathi, N., Pathak, K., & Ughade, S. (2011). Menstrual hygiene: knowledge and practice among adolescent school girls of Saoner, Nagpur district. J Clin Diagn Res, 5(5), 1027–1033.

Thakur, H., Aronsson, A., Bansode, S., Stalsby Lundborg, C., Dalvie, S., & Faxelid, E. (2014). Knowledge, practices, and restrictions related to menstruation among young women from low socioeconomic community in Mumbai, India. Frontiers in Public Health, 2, 72.

TMA (2021), about tamale metropolis,ghanadistricts.com/home/district/139

Torondel, B., Sinha, S., Mohanty, J. R., Swain, T., Sahoo, P., Panda, B., Nayak, A., Bara, M., Bilung, B., Cumming, O., Panigrahi, P., & Das, P. (2018). Association between

unhygienic menstrual management practices and prevalence of lower reproductive tract infections: a hospital-based cross-sectional study in Odisha, India. BMC Infectious Diseases 2018 18:1, 18(1), 1–12. https://doi.org/10.1186/S12879-018-3384-2

Torondel, B., Sinha, S., Mohanty, J. R., Swain, T., Sahoo, P., Panda, B., Nayak, A., Bara, M., Bilung, B., Cumming, O., Panigrahi, P., & Das, P. (2018). Association between unhygienic menstrual management practices and prevalence of lower reproductive tract infections: a hospital-based cross-sectional study in Odisha, India. BMC Infectious Diseases 2018 18:1, 18(1), 1–12. https://doi.org/10.1186/S12879-018-3384-2

UNESCO. Good policy and practice in health education: Puberty Education & Menstrual Hygiene Management. 2014;

UNICEF, editor. Solomon Islands: Incorporating MHM into national WASH in schools' policies and guidelines. 4th MHM Virtual Conference, 22-23 October 2015, 2015.

UNICEF. (2004). The State of the World's Children 2004, 147. http://doi.org/92-806-3784-5

UNICEF. (2019). Guide to menstrual hygiene materials. Available at:) (Accessed November 5, 2019) UNICEF, New York.

Upashe SP, Tekelab T, Mekonnen J. Assessment of knowledge and practice of menstrual hygiene among high school girls in Western Ethiopia. BMC Womens Health. 2015;15(1):84.

Vashisht, A., Pathak, R., Agarwal, R., Padvekar, B. N., & Panda, M. (2018). School absenteeism during menstruation amongst adolescent girls in Delhi, India. Journal of family & community medicine, 25(3), 163.

Wall LL, Belay S, Bayray A, Salih S, Gabrehiwot M. A community-based study of menstrual beliefs in Tigray, Ethiopia. Int J Gynecol Obstet. 2016;135(3):310–3.

Water Aid: Is Menstrual Hygiene and Management an issue for Adolescent Girls? Water Aid in South Asia Publication; 2009.

WaterAid. (2019). Menstrual Hygiene Management: Informed Product Choice and Disposal. WaterAid, www.wateraidindia.in.

WaterAid. Is Menstrual Hygiene and Management an issue for adolescent school girls in Nepal. Kathmandu; 2010.

Wiesemann F, Adam R. Absorbent products for personal health care and hygiene. In: Handbook of medical textiles. Elsevier; 2011. p. 316–35.

Wiesemann, F., & Adam, R. (2011). Absorbent products for personal health care and hygiene. In Handbook of medical textiles (pp. 316–335). Elsevier.

Winkler, I., Roaf, V. (2014): Taking the bloody linen out of the closet: Menstrual hygiene as a priority for achieving gender equality. Cardozo Journal of Law & Gender http://papers.ssrn.com/sol3/papers.cfm?abstract_ id=2575250

Wiwanitkit V. Sanitary pad dermatitis. Indian J Dermatol. 2009;54(4):391.

Wong, L. P. (2011). Attitudes towards dysmenorrhoea, impact and treatment seeking among adolescent girls: A rural school- based survey. Australian Journal of Rural Health, 19(4), 218–223.

WSSCC and UN Women. (2014). No Title Menstrual hygiene management: behaviour and practices in the Louga Region, Senegal, Water Supply and Sanitation Collaborative Council and UN Women West Africa Sub Regional Office, Geneva, Switzerland.

York, T. T., Gibson, C., & Rankin, S. (2015). Defining and measuring academic success. Practical assessment, research, and evaluation, 20(1), 5.

Zegeye, D. T., Megabiaw, B., & Mulu, A. (2009). Age at menarche and the menstrual pattern of secondary school adolescents in northwest Ethiopia. BMC Women's Health, 9(1), 29.

Ziba, F., Yakong, V., Asore, R., Frederickson, K., & Flynch, M. (n.d.). DOUCHING PRACTICES AMONG WOMEN IN THE BOLGATANGA.

APPENDIX I: QUESTIONNAIRE

UNIVERSITY FOR DEVELOPMENT STUDIES

DATE: SEX: MALE/ FEMALE

PREAMBLE: THE PURPOSE OF THIS QUESTIONNAIRE IS TO EXPLORE THE EFFECTS OF MENSTRUAL HYGIENE MANAGEMENT ON THE ACADEMIC PERFORMANCE OF JHS GIRLS IN THE TAMALE METROPOLIS.

SECTION A

Socio-demographic Information

Kindly tick (√) in the circle against your preferred answer

Age

O 8-15 O 16-18 O 18-20

Gender

O Male O Female

Form/class

O Jhs1 O Jhs2 O Jhs3

Religion

O Muslim O Christian O African Traditional O Other

Ethnicity

O Dagomba O Gonja O Frafra O Others

SECTION B

NO.	QUESTION	RESPONSE [ ]
	Knowledge on Menstrual Hygiene	
1	Have you in any case heard about menstruation before?	Yes [ ] No [ ]
2	Have you heard of menstrual hygiene?	Yes [ ] No [ ]
3	What are your sources of information on menstruation?	Class room [ ] Electronic media [ ] Friends [ ] Print media [ ]
4	Have you menstruated?	Yes [ ] No [ ]
5	Menstruation is a disease	Yes [ ] No [ ]
6	Pregnant women menstruate	Yes [ ] No [ ]

7	Menstrual blood contains harmful substances	Yes [ ] No [ ]
8	It is harmful for a woman's body if she runs or dances during her period	Yes [ ] No [ ]
9	Menstruation can cause discomfort like dizziness or tiredness	Yes [ ] No [ ]
10	Menstruation can cause pain	Yes [ ] No [ ]
11	Menstrual blood comes from the stomach where food is digested	Yes [ ] No [ ]
	SECTION C: MENSTRUAL HYGIENE PRACTICES IN SCHOOL	
1	Do you go to school during your period?	Yes [ ] No [ ]
2	What menstrual materials do you use?	sanitary pads [ ]

		menstrual cup[ ] tampons [ ] Reusable materials [ ] Others, please specify by writing…….
3	How many times do you change your menstrual material in a day at school?	Once [ ] Twice [ ] Other
4	How do you dispose your menstrual material when in school?	the dustbin [ ] the toilet [ ] keep it in my bag till I get home [ ] Other…….
5	Do you have concentration problems in class during menstruation?	Yes [ ] No [ ]
6	Are you able to partake in all school activities during menstruation?	Yes [ ] No [ ]
7	Specify some problems you face when attending school during menstruation?	Pain during menstruation [ ] Fear of stains or smell [ ] Feeling tired, dizzy, weak, unwell [ ]

		Other……
8	Is there enough time in breaks for change of menstrual item?	Yes [ ] No [ ]
9	Are you able to leave class to wash in case of a leak?	Yes [ ] No [ ]

SECTION D

Kindly indicate your level of agreeableness with these statements by ticking (√).

Statement	Strongly Disagree	Disagree	Neutral	Strongly agree	Agree
I knew about menstruation before menarche.					
I am able to wash my hands when I want to at school					
My menstrual materials are comfortable					

When at school, I am able to change my menstrual materials when I want to					
When at school, I am satisfied with the place I use to change my menstrual materials					
When at school, I worry that others would see my menstrual blood after I urinate					
When at school, I worry that I would not be able to change my menstrual materials when I need to					
I worry that my menstrual materials would allow blood to pass through to my outer garments					
I have enough of my menstrual materials to change them as often as					

I wanted to					
I feel comfortable carrying spare menstrual materials with me outside my home					
I worried about where to dispose of my used menstrual materials					
I fear standing up in class to answer questions during my period					
I am able to partake in extra curriculum activities during my period					
I am able to fully concentrate in class during my period					

APPENDIX II: SAMPLE FOCUS GROUP DISCUSSION INTERVIEW GUIDE

UNIVERSITY FOR DEVELOPMENT STUDIES

STUDY TITLE: EFFECTS OF MENSTRUAL HYGIENE MANAGEMENT ON THE ACADEMIC PERFORMANCE OF JHS GIRLS IN THE TAMALE METROPOLIS.

DATE: …….

PREAMBLE: THE PURPOSE OF THIS FOCUS GROUP DISCUSSION INTERVIEW GUIDE IS TO EXPLORE THE EFFECTS OF MENSTRUAL HYGIENE MANAGEMENT ON THE ACADEMIC PERFORMANCE OF JHS GIRLS IN THE TAMALE METROPOLIS.

How would you describe the involvement of your female students throughout the term?

Does the school make provision for menstrual hygiene management lessons?

Does the school make provision for sessions that helps female students learn to manage menstrual hygiene and their academics?

Does the school consider menstruating students when designing extra curriculum activities?

How often do you notice your students lower their participation in class?

How would you rate the attendance of your female students?

Do you detect an impact on the academic performance of your students when they reach puberty?

What do you think account for the reduction in academic performance of your students?

What recommendations will you have for the study ?

Thank you for your time!

APPENDIX III: VOLUNTARY CONSENT FORM FOR PARTICIPANTS

Statement of person obtaining informed consent:

I have fully explained this research to _____ and have given sufficient information about the study, including that on procedures, risks and benefits, to enable the prospective participant make an informed decision to or not to participate.

DATE: _____ NAME: _____

Statement of person giving consent:

I have read the information on this study/research or have had it translated into a language I understand. I have also talked it over with the interviewer to my satisfaction.

I understand that my participation is voluntary (not compulsory).

I know enough about the purpose, methods, risks and benefits of the research study to decide that I want to take part in it.

I understand that I may freely stop being part of this study at any time without having to explain myself.

I have received a copy of this information leaflet and consent form to keep for myself.

NAME: _____

DATE: _____ SIGNATURE/THUMB PRINT: _____

Statement of person witnessing consent (Process for Non-Literate Participants):

I (Name of Witness) certify that information given to (Name of Participant), in English and translated in the local language, is a true reflection of what l have read from the study Participant Information Leaflet, attached.

WITNESS' SIGNATURE (maintain if participant is non-literate): _____

APPENDIX IV: INTRODUCTORY LETTER FROM THE DEAN OF SCHOOL OF PUBLIC HEALTH SOCIAL AND BEHAVIOURALCHANGE.

UNIVERSITY FOR DEVELOPMENT STUDIES
School of Public Health

Tel : 03720 - 94080
E-Mail : sphdean@uds.edu.gh

Local : 5:7811/106.15
Internet: www.uds.edu.gh

Post Office Box TL 1883,
Tamale, Ghana. West Africa.

3/02/2022

Office of the Dean

The Chairperson
Institutional Review Committee
University for Development Studies
Tamale,
Northern Region

LETTER OF INTRODUCTION

I write to introduce to you Ms. Nuhu Alimatu Sadia second-year MPhil Community Health and Development student in the Department of Social and Behavioural Change, School of Public Health. As part of the requirement, Ms. Nuhu is expected to write and submit a well-written thesis to the School as part of the requirements for graduation. As part of the process, Ms. Nuhu is applying to your committee for ethical clearance on the topic: "***EFFECTS OF MENSTUAL HYGIENE MANAGEMENT ON ACADEMIC PERFORMANCE OF JUNIOR HIGH SCHOOL GIRLS IN THE TAMALE METROPOLIS***". I would be very grateful if you could assist her by way of ethical clearance to enable her execute this project to a successful end.

Thank you.

OFFICE OF THE DEAN
SCHOOL OF PUBLIC HEALTH
UNIVERSITY FOR DEV'T
STUDIES, TAMALE

Ruhia Abdulai
(School Officer)
for: Dean, SPH