



**Institute for Water
and Energy Sciences
(incl. Climate Change)**



**PAN-AFRICAN UNIVERSITY
INSTITUTE FOR WATER AND ENERGY SCIENCES
(Including CLIMATE CHANGE)**

Master Thesis

Submitted in partial fulfillment of the requirements for the master's degree in

WATER POLICY

Presented by

Vivian WREH

**Accessing WASH Facilities in Schools to Address the Issue of Stigmatized
Menstruating Students in Liberia: Montserrado County as a Case Study**

Chair:

Supervisor:

Co-Supervisor:

External Examiner:

Internal Examiner:

PAN AFRICAN UNIVERSITY
INSTITUTE FOR WATER AND ENERGY SCIENCES
(Including CLIMATE CHANGE) (PAUWES)

**Accessing WASH Facilities in Schools to Address the Issue of Stigmatized
Menstruating Students in Liberia: Montserrado County as a Case Study**

**A Thesis Submitted to the Institute for Water and Energy Sciences
(Including Climate Change) of the Pan African University
in partial fulfillment of the Requirements for
The Award of the Degree of Master of Science (MSc.) in
Water Policy**

By:

Vivian F. Wreh

Supervisor: Prof. Dr. Chicgoua Noubactep

DECLARATION

I certify that the research presented in this thesis was conducted entirely by me at the Pan-African University Institute for Water and Energy Sciences (including Climate Change), located at the University of Tlemcen in Algeria.

1. Priv.-Doz. Dr. Chicgoua Noubactep

Hydro geochemist

Department of Applied Geology

The University of Göttingen oversaw this independent study.

2. Dr. Salia S. Sheriff

Asst. Professor

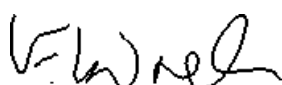
Department of Environmental Science and Climate Change

University of Liberia

This thesis has never been presented in whole or in part for a degree at any institution.

All citations and acknowledgments of prior works and sources have been noted.

Signed by Student:



Vivian F. Wreh

Student, Water Policy

PAUWES

Signed by supervisor:



Supervisor Name: Dr. Chicgoua Noubactep

ACKNOWLEDGEMENT

I want to thank my supervisors, Dr. Chicgoua Noubactep and Dr. Salia Sheriff, for their consistent support, guidance, and mentorship during this research project. Their knowledge and helpful feedback have been invaluable in influencing the direction of this study and improving its overall quality. I sincerely appreciate their unwavering dedication and commitment to assisting me in navigating the intricacies and difficulties of the research process.

I want to express my sincere gratitude to the participants who graciously contributed their time, experiences, and perspectives to this research. Their active participation in the data collection methods has yielded valuable insights and data for analysis. I deeply value their valuable contributions, which have enhanced the findings and brought greater depth to the discussion.

I am deeply grateful to my colleagues and friends for their unwavering support throughout this research. The support, conversations, and openness to contribute and give feedback have played a crucial role in shaping my ideas and improving my approach. I appreciate the sense of camaraderie and collaborative spirit that have enhanced the fulfillment and rewards of this research experience.

I want to express my gratitude for the generous financial assistance provided by The African Union. The funding I received has been instrumental in facilitating my research, providing access to essential resources, and sharing the findings. I am grateful for their investment and the opportunities they have afforded me.

I sincerely thank my family, particularly my mother, Linda B. Morris, and my sister, Racquel Wreh, for their consistent support, understanding, and encouragement during this research undertaking. Their unwavering support and faith in me have consistently bolstered my determination and drive. I sincerely appreciate the sacrifices made by others that have enabled me to pursue my academic and research goals.

Also, I would like to express my gratitude to all those who have contributed valuable contributions to this research project's successful completion.

Above all, I am grateful to the Almighty God for His guidance and unmerited mercies that have supported me throughout this journey.

ACRONYMS

MHM- Menstrual Hygiene Management

WASH- Water Sanitation Hygiene

WinS- WASH in Schools

WHO- World Health Organization

UNICEF- United Nations International Children's Emergency Fund

UNESCO- United Nations Educational, Scientific and Cultural Organization.

SDGs- Sustainable Development Goals

NGOs -Non-governmental organizations

EMIS- Education Management Information System

NSWSS-National School WASH Strategy

LNWSHC -Liberia National Water, Sanitation, and Hygiene Commission

MCSS- Monrovia Consolidated School System

FGDs- Focus Group Discussions

TABLE OF CONTENTS

| | |
|---|-----|
| DECLARATION..... | ii |
| ACKNOWLEDGEMENT..... | iii |
| ACRONYMS..... | iv |
| TABLE OF CONTENTS | v |
| LIST OF FIGURES..... | ix |
| LIST OF TABLES | x |
| ABSTRACT | xi |
| CHAPTER 1: INTRODUCTION..... | 1 |
| 1.1 Background | 1 |
| 1.2 Problem Statement..... | 2 |
| 1.3 Research Objectives:..... | 3 |
| 1.3.1 Specific Objectives:..... | 3 |
| 1.4 Research Questions..... | 3 |
| 1.5 Relevance of the Research | 4 |
| 1.6 Thesis Outline..... | 4 |
| CHAPTER 2: LITERATURE REVIEW..... | 6 |
| 2.1 Introduction | 6 |
| 2.2 Definition and Importance of MHM..... | 6 |
| 2.3 Global Perspective on WASH Facilities and Menstrual Hygiene | 7 |
| 2.4 Case studies of successful WASH interventions in schools around the world..... | 8 |
| 2.4.1 WASH in Schools Programme in Kenya | 8 |
| 2.4.2 WASH in Schools India | 9 |
| 2.4.3 The Enhanced Water, Sanitation, and Hygiene (WASH) Services in Schools and Communities initiative in Ghana | 9 |
| 2.5 Challenges Faced by Female Students in Managing Menstruation at School | 10 |

| | |
|---|----|
| 2.5.1 Lack of access to water, sanitation, and menstrual supplies..... | 10 |
| 2.5.2 Stigmatization and Social Taboos Surrounding Menstruation..... | 10 |
| 2.6 Existing Research on WASH Facilities and Menstrual Hygiene Management..... | 11 |
| 2.6.1 WaterAid's Menstrual Hygiene Matters Report (2012)..... | 11 |
| 2.6.2 A Time for Global Action: Addressing Girls' Menstrual Hygiene Management Needs in Schools..... | 12 |
| 2.6.3 Menstrual hygiene management in Ugandan schools | 12 |
| 2.7 Findings on the Impact of Improved WASH Facilities on Menstrual Hygiene Practices | 13 |
| 2.8 Government Policies and Programmatic Responses to Address Menstruation-Related Challenges..... | 14 |
| 2.8.1 Menstrual Hygiene Management Guidelines for Schools in India (UNICEF India, 2014) | 14 |
| 2.8.2 The Menstrual Hygiene Management Policy for Kenya (NIXON, 1953) | 14 |
| 2.8.3 The National School WASH Minimum Standards of Ethiopia (MOE-Ethiopia, 2017) | 15 |
| 2.9 Non-governmental organization (NGO) interventions to improve WASH Facilities.... | 16 |
| 2.10.1 Overview of the current situation in Montserrado County | 17 |
| 2.10.2 The Importance of WASH Facilities in Schools | 18 |
| 2.10.3 Availability of WASH Facilities in Montserrado | 19 |
| 2.11 Water Supply..... | 20 |
| 2.11.1 Water Sources..... | 20 |
| 2.11.2 Access to water in schools | 20 |
| 2.11.3 Sanitation of School in Montserrado County..... | 20 |
| 2.12 Access to latrines in schools..... | 21 |
| 2.12.1 Public Schools Latrines in Liberia | 21 |
| 2.12.2 Private Schools Latrines in Liberia | 22 |
| 2.12.3 Toilet facilities that incorporate menstrual hygiene components..... | 22 |

| | |
|--|----|
| 2.13 Hygiene | 23 |
| 2.13.1 Access to hand-washing Facilities in Liberia..... | 23 |
| 2.14 Impact on Absenteeism Attendance and Academic Performance | 24 |
| CHAPTER 3: METHODOLOGY | 26 |
| 3.1 Introduction | 26 |
| 3.2 Research Design | 26 |
| 3.3 Description of Study Area | 27 |
| 3.4 Data Collection Method | 28 |
| 3.4.1 School Selection..... | 29 |
| 3.4.2 Activities | 30 |
| 3.5 Sampling Techniques and Sample Size | 30 |
| 3.6 Data Processing and Analysis..... | 31 |
| 3.7 Ethical Considerations | 32 |
| CHAPTER 4: RESULTS AND DISCUSSION | 33 |
| 4.1 Distribution of Study Participants | 33 |
| 4.2 Demographic characteristics of the study participants | 34 |
| 4.2.1 Grade level of students | 34 |
| 4.2.2 Age and Gender Factors | 35 |
| 4.3 Students' Knowledge of Menstrual Hygiene | 35 |
| 4.4 Availability and Access to Menstrual Hygiene Products | 36 |
| 4.4.1 Access to menstrual hygiene information | 36 |
| 4.4.2 Availability of menstrual hygiene products | 37 |
| 4.4.3 Accessibility to menstrual products for students..... | 38 |
| 4.5 WASH Facility Conditions..... | 38 |
| 4.5.1 Cleanliness of Wash facilities | 38 |
| 4.5.2 Cleaning frequency of WASH facilities | 40 |
| 4.5.3 Probing WASH Facilities..... | 41 |

| | |
|--|----|
| 4.5.4 Comfortability of Students During Menstrual Period | 42 |
| 4.6 Peer Influence and related Stigmatization due to menstrual hygiene | 43 |
| 4.6.1 Students personal feelings about menstruation..... | 44 |
| 4.6.2 Effect of peer influence on the perception of menstruation..... | 45 |
| 4.7 Impact on attendance and academic performance | 46 |
| 4.7.1 Attendance | 46 |
| 4.7.2 Academic Performance..... | 48 |
| 4.8 Student Proposed Improvements | 49 |
| CHAPTER 5: CONCLUSION AND RECOMMENDATIONS..... | 51 |
| 5.1 Conclusion..... | 51 |
| 5.2 Recommendations..... | 52 |
| REFERENCE | 55 |
| APPENDICES | 62 |
| Appendix 1: Questionnaire for Data Collection..... | 62 |
| Appendix 2: Letter of Permission from the Monrovia Consolidated School System (MCSS)..... | 65 |
| Appendix 3: Internship Application..... | 66 |
| Appendix 4: Acceptance Letter | 67 |
| Appendix 5: Letter of Appreciation | 68 |

LIST OF FIGURES

| | |
|---|----|
| Figure 3.1: Study Area Map | 28 |
| Figure 4.1: Percentage of students interviewed | 33 |
| Figure 4.2: Class distribution of students | 34 |
| Figure 4.3: Age categories of students | 35 |
| Figure 4.4: Students' knowledge of Menstrual Hygiene | 36 |
| Figure 4.5: Cleanliness of WASH Facilities | 39 |
| Figure 4.6: Cleaning Frequency of WASH Facilities..... | 40 |
| Figure 4.7: Comfortability Frequency during Menstruation | 42 |
| Figure 4.8: Stigmatization being experienced by students in school..... | 44 |
| Figure 4.9: Students Feelings about Menstruation | 45 |
| Figure 4.10: Peer perception of menstruation | 46 |
| Figure 4.11: Percentages of impact on attendance..... | 47 |
| Figure 4.12: Student proposed improvements | 50 |

LIST OF TABLES

| | |
|--|----|
| Table 3.1: Characteristics of Schools | 29 |
| Table 4.1: Access to menstrual hygiene for students | 37 |
| Table 4.2: Menstrual hygiene products available in schools | 37 |
| Table 4.3: Accessibility to menstrual products for students | 38 |
| Table 4.4: Probing WASH facilities | 41 |
| Table 4.5: Academic performance of students during menstruation..... | 48 |

ABSTRACT

In modern Liberian society, there is a perception of a prevailing culture of silence surrounding the topic of menstruation, where it is often viewed as unclean and taboo, particularly in traditional settings. This lack of open dialogue and instruction regarding menstrual cleanliness has left numerous schoolgirls uninformed and ill-prepared to handle their periods adequately. Despite the crucial role that maintaining proper menstrual hygiene plays in safeguarding the health and welfare of females, this matter has not garnered the requisite attention and urgency from national health authorities, including the Water, Sanitation, and Hygiene (WASH) Commission of Liberia.

To address this gap in knowledge and support, a comprehensive study was undertaken to explore the factors influencing Menstrual Hygiene Management (MHM) among schoolgirls in Liberia and to propose effective mitigation strategies for enhancing menstrual hygiene practices during their menstruation periods. Employing a mixed-method approach with a cross-sectional descriptive design, the research focused on schools' WASH status and understanding girls' perceptions, behaviors, and competencies related to menstrual hygiene.

The study surveyed four schools in Montserrado County, Liberia, comprising two private schools: Joseph Jenkins Roberts United Methodist School and John G. Mills High School) and two public schools, William V.S. Tubman and G.W. Gibson High School, with a sample size of 400 students from the senior high division (10th – 12th grade) with the corresponding ages of 15-21 years defined by the Ministry of Education. Findings from the research highlighted key challenges faced by schoolgirls, including a lack of educational resources on MHM, limited knowledge and experience of menstruation, and inadequate sanitation facilities on school premises, all of which significantly impact their ability to manage menstrual hygiene effectively.

Notably, the study revealed that many schools in Liberia have substandard sanitation facilities, leading to female students missing school days during their menstruation periods. The observation of shared unsanitary facilities for both girls and boys further underscored the urgent need for improved infrastructure and hygiene practices in educational settings.

In light of these findings, the WASH in Schools (WinS) unit of the Ministry of Education of Liberia must take proactive measures to address these challenges. This includes conducting regular inspections of schools' WASH facilities, integrating comprehensive menstrual hygiene management into the education curriculum across Liberian schools, and providing girls with the necessary support, information, and safe spaces to practice proper menstrual hygiene. By prioritizing MHM within the education system, Liberia can empower its schoolgirls to manage their menstrual health effectively and ensure their continued participation in education without disruption.

CHAPTER 1: INTRODUCTION

1.1 Background

Around the world, there is accrued evidence of the many barriers faced by schoolgirls to safe, hygienic, and dignified menstruation (Hennegan, Shannon, et al., 2019), (Hennegan, Tsui, et al., 2019), (Sommer et al., 2021), (Tshomo et al., 2021), (Jahan et al., 2024). Sommer et al. (2021) summarized the challenges in the following three key points: (i) inadequate health education about menstruation and puberty, (ii) lack of social support from teachers and peers for managing menses in school, and (iii) limited or nonexistent information prior to menstrual onset. Another key challenge in public institutions and schools has been insufficient access to water, sanitation, hygienic materials (WASH facilities), and disposal infrastructure (Hennegan, Shannon, et al., 2019), (Hennegan, Tsui, et al., 2019), (Jahan et al., 2024). They named four barriers that contribute to gender-discriminatory physical school environments and pervasive menstruation-related stigma, enabling behavioral restrictions and feelings of shame and stress (Sommer et al., 2021), (Girmay et al., 2023), (Jahan et al., 2024).

The social norms in school environments have a significant impact on the self-esteem, well-being, and educational experiences of individuals who menstruate, leading to profound implications for them (Vaughn, 2013). Moreover, the lack of attention creates an atmosphere where menstrual hygiene is dealt with in a secretive and shameful manner, which hampers students' ability to handle their menstruation confidently and without affecting their education. Menstrual stigma is a result of cultural taboos, societal norms, and a lack of comprehensive understanding (Olson et al., 2022). It is fuelled by misconceptions, preconceived notions, and a long-standing hesitancy to have candid discussions about menstruation. Schools, like miniature versions of society, mirror and uphold these attitudes, molding the minds of young individuals and shaping how society sees things. The consequences of menstrual stigma have a broad impact, affecting the mental and emotional health of students who menstruate, as well as their academic performance and attendance (Munro et al., 2021), (Sommer et al., 2021), (Girmay et al., 2023).

Enhancing WASH facilities in schools is vital to addressing the menstrual stigma (Long et al., 2013), (Hennegan, Tsui, et al., 2019), (Hennegan, Shannon, et al., 2019), (Jahan et al., 2020). When educational institutions consider both the physical infrastructure and the socio-cultural context, they can bring about positive change by challenging long-standing taboos and creating an inclusive and respectful environment.

1.2 Problem Statement

Controlling menstruation is essential for achieving gender equality and the general schooling success of girls. Many girls around the world face challenges in accessing menstrual hygiene products and proper education about menstruation, leading to frequent school absences and decreased academic performance (House et al., n.d.). This lack of access to menstrual hygiene resources hinders their ability to participate in educational opportunities fully, ultimately perpetuating gender inequality and limiting their overall success in school.

For most girls in Liberia, entering puberty is a pivotal time, and due to a lack of information and services on menstruation and the physical changes that take place, many girls experience fear and worry (Ellis et al., 2016). The absence of practical advice on menstrual hygiene management and a biological understanding of menstruation, inadequate school facilities, and restricted access to absorbent materials are some of the obstacles determined by sociocultural elements in Montserrado County's public schools.

In addition to self-exclusion, limited school engagement, distraction, missing class time, absenteeism, and pregnancy dread, the difficulties girls experienced influenced their health and education (Asumah et al., 2022). A school dropout, infections, long-term mental health effects, and unintended pregnancy are just a few health hazards associated with improper management and understanding of menstruation. Moreover, the lack of knowledge about menstruation, sanitary products, and an unwelcoming learning environment could make it difficult for female students at public schools in Montserrado County, Liberia, to pursue their goal of attending school.

(Barkollie, 2022) study conducted in Liberia investigated the various factors that influence Menstrual Hygiene Management (MHM) among schoolgirls in the country and identified effective mitigation strategies for improving menstrual hygiene during their menstruation periods. Several key findings emerged from the study, highlighting schoolgirls' challenges in managing their menstrual hygiene. These challenges included limited access to menstrual hygiene products such as pads or tampons, inadequate WASH facilities in schools, stigma and shame surrounding menstruation, lack of knowledge about menstrual hygiene practices, and cultural taboos related to menstruation.

Inadequate guidance, facilities, and resources for girls to manage their menstruation in school are a neglected public health, social, and academic issue that requires prioritizing, coordination,

and investment. Many public schools in developing countries, such as Liberia, lack adequate WASH facilities, which is detrimental to students' academic performance and general health. Furthermore, one of the most severe issues resulting from a lack of suitable facilities is the stigma associated with menstruation among students. Therefore, there must be access to water, sanitation, and hygiene (WASH) facilities to maintain excellent health and hygiene.

1.3 Research Objectives:

This research aims to stimulate the enhancement of water, sanitation, and hygiene (WASH) facilities in schools within Montserrado County, elevating menstruating students' educational environment and overall well-being.

1.3.1 Specific Objectives:

- i. To assess the current state of Water, Sanitation, and Hygiene (WASH) facilities in Montserrado County's schools in Liberia.
- ii. To assess the changes in students' knowledge, attitudes, and practices related to menstrual hygiene management due to participating in gender-sensitive WASH-responsive programs in Montserrado County schools.
- iii. To assess the effect of improved WASH facilities on female students' attendance, academic performance, and general well-being.

1.4 Research Questions

The effort put forward to enhance the water, sanitation, and hygiene (WASH) facilities at public schools in Montserrado County, Liberia, needs to be more consistent. The following potential study questions were developed in response to the challenges of enhancing WASH infrastructure in public schools to address the stigmatized inequity of menstruation students in Montserrado County, Liberia.

- i. How do the current Water, Sanitation, and Hygiene (WASH) facilities in Montserrado County's schools in Liberia impact students' overall health and educational outcomes?
- ii. What is the impact of gender-sensitive WASH-responsive programs focusing on menstrual hygiene management in Montserrado County schools?
- iii. How does the improvement of WASH facilities affect the attendance, academic performance, and overall well-being of female students?

1.5 Relevance of the Research

This study will thoroughly examine how poor WASH facilities disproportionately influence female students, resulting in gender inequalities in educational outcomes. Furthermore, this research on improving WASH facilities and menstrual hygiene management is highly relevant, as it addresses a critical issue that affects the health, education, and well-being of millions of girls and women worldwide.

Lack of access to safe and private WASH facilities and inadequate menstrual hygiene management can lead to various adverse outcomes, including infections, stigma, shame, absenteeism, and dropout from school. These outcomes can have long-term implications for girls' and women's health, education, and economic opportunities. By conducting this research, we can better understand the barriers and facilitators to WASH facilities and menstrual hygiene management in schools and the impact of these facilities on girl's and women's health and education outcomes.

This knowledge can inform the development of evidence-based policies and programs that promote access to safe and private WASH facilities and menstrual hygiene management for all girls and women. Ultimately, this research can contribute to the achievement of several Sustainable Development Goals, including SDG 3 (good health and well-being), SDG 4 (quality education), SDG 5 (gender equality), and SDG 6 (clean water and sanitation).

1.6 Thesis Outline

Briefly stated, my master's thesis will include the following:

Chapter (I) Introduction encompasses the study's context, problem statements (significant issues requiring attention), research questions, and objectives (the problems this thesis will attempt to address).

Chapter (II) Literature Review: What strategy did the earlier researchers use to address this problem? The potential for WASH improvement in Liberia will be discussed, along with a brief introduction and details on the country's WASH facility profile. It will also quickly review other nations' strategies to enhance WASH and MHM to prevent students' stigmatization throughout their menstrual cycle.

Chapter (III) Methodology: This chapter thoroughly describes the procedures followed during the research, including the methods utilized to collect and process the data, the type of research strategy, and why they are suitable for this thesis work.

Chapter (IV) Results and Discussion: This chapter presents the outcomes of each methodology-related action and discusses the findings from several schools in Montserrado County regarding ways to stop stigmatizing students during their menstrual cycles.

Chapter (V) Conclusion, recommendation, and direction for future research: This chapter reviews the conclusions and discussions from the previous chapter and makes some recommendations for upcoming efforts. The study's findings and suggestions will be used to assess the project's viability.

Chapter (IV) Results and Discussion: This chapter presents the outcomes of each methodology-related action and discusses the findings from several schools in Montserrado County regarding ways to stop stigmatizing students during their menstrual cycles.

Chapter (V) Conclusion, recommendation, and direction for future research: This chapter reviews the conclusions and discussions from the previous chapter and makes some recommendations for upcoming efforts. The study's findings and suggestions will be used to assess the project's viability.

CHAPTER 2: LITERATURE REVIEW

2.1 Introduction

Assessing the Status of WASH Facilities in schools to address menstruation-related challenges faced by female students is a pressing global concern, particularly in regions where reliable access to water, sanitation, and hygiene (WASH) facilities is limited. Like many developing nations, Liberia grapples with significant obstacles in providing adequate school WASH facilities, especially concerning menstrual hygiene management. To effectively tackle this issue, leveraging the experiences and best practices of countries that have overcome similar challenges in improving WASH infrastructure in educational settings is imperative. This chapter explores how various nations have addressed school menstruation-related challenges by examining existing research and empirical evidence. The focus is on two crucial aspects: enhancing WASH facilities accessibility and combating menstrual stigmatization.

As policymakers and stakeholders devise tailored approaches to alleviate school menstruation-related challenges, insights from other countries' experiences can inform Liberia's efforts in this domain. This chapter serves as the cornerstone for subsequent discussions, providing a comprehensive analysis of the status of WASH facilities in schools and offering recommendations and policy measures to effectively address Liberia's menstrual hygiene dilemma.

2.2 Definition and Importance of MHM

Menstrual Hygiene Management (MHM) refers to the practices, facilities, and materials that women and girls use during menstruation to ensure their menstrual hygiene and well-being. It encompasses a range of activities, including using menstrual hygiene products (such as pads, tampons, or menstrual cups), access to clean water and sanitation facilities for washing and disposal, and education on menstrual health and hygiene practices. MHM also includes addressing social norms, taboos, and stigma related to menstruation to promote dignity and empowerment for women and girls (Swedish International Development Cooperation Agency, 2016).

Menstrual hygiene management (MHM) is critical to women's health and well-being, particularly in school settings. As highlighted (Davis et al., 2018), MHM encompasses the specific hygiene and health needs of girls and women during menstruation, including the knowledge, materials, and Water, Sanitation, and Hygiene (WASH) facilities required for effective management. It is essential to recognize that menstruation is a natural process and

should not be stigmatized. Girls must feel empowered to openly discuss the emotional and mental challenges they may face during menstruation to receive the support they need.

Adequate access to water, menstrual supplies, and private sanitation facilities is crucial for maintaining proper menstrual hygiene, as emphasized by (Abor, 2022). However, (Ellis et al., 2016) reports have shown that many girls in developing countries face challenges in managing their menstruation due to insufficient WASH facilities. This lack of access not only leads to physical discomfort but also contributes to the psychological stress associated with menstruation.

In response to these challenges, international organizations such as the World Health Organization (WHO) and UNICEF have recommended integrating WASH facilities in schools to support menstrual hygiene management. Initiatives like the Swachh Bharat: Swachh Vidyalaya program in India have demonstrated the importance of providing soap, water, and private spaces for menstrual absorbent change and disposal in school settings (Yaliwal et al., 2020).

In Liberia, specifically in Montserrado County, enhancing WASH facilities in schools to address the stigmatization of menstruating students remains a significant challenge. Despite ongoing efforts to improve menstrual hygiene management at schools, barriers persist, necessitating further research and innovative solutions. By prioritizing the provision of adequate WASH facilities and promoting open discussions about menstruation, schools in Liberia can create a supportive environment that empowers girls to manage their menstruation with dignity and confidence.

2.3 Global Perspective on WASH Facilities and Menstrual Hygiene

2.3.1 International guidelines and recommendations for WASH facilities in schools

International guidelines and recommendations for Water, Sanitation, and Hygiene (WASH) facilities in schools play a crucial role in promoting students' health, well-being, and educational outcomes, particularly for girls (Sommer & Sahin, 2013). These guidelines are designed to ensure that schools provide adequate and appropriate WASH facilities to meet the needs of all students, including those menstruating. Here are some critical international guidelines and recommendations for WASH facilities in schools:

- I. WHO/UNICEF Joint Monitoring Programme (JMP) for Water Supply, Sanitation, and Hygiene: The WHO/UNICEF JMP is a global program that monitors progress towards Sustainable Development Goal 6, including WASH targets. The JMP sets standards for

WASH facilities in schools, including access to clean water, sanitation facilities, and hygiene promotion. The program emphasizes the importance of gender-sensitive facilities that address the specific needs of girls, including menstrual hygiene management.

- II. United Nations Educational, Scientific and Cultural Organization (UNESCO) Guidelines on Gender-Responsive Pedagogy: UNESCO has developed guidelines on gender-responsive pedagogy that emphasize the importance of creating a supportive and inclusive learning environment for all students, regardless of gender. These guidelines highlight the need for schools to provide gender-segregated sanitation facilities that meet the needs of girls, including access to menstrual hygiene products and disposal facilities.
- III. Sustainable Development Goals (SDGs): The SDGs include targets related to WASH, precisely Goal 6: Ensure availability and sustainable management of water and sanitation for all. Target 6.2 calls for access to adequate and equitable sanitation and hygiene for all and ending open defecation by 2030. This target underscores the importance of providing safe and hygienic school WASH facilities to promote health and well-being.
- IV. Menstrual Hygiene Management in Schools: Several organizations, including UNICEF, WaterAid, and Plan International, have developed guidelines specifically focused on menstrual hygiene management in schools. These guidelines emphasize the importance of providing girls with separate, private, and safe sanitation facilities, access to menstrual hygiene products, and education on menstrual hygiene practices.

2.4 Case studies of successful WASH interventions in schools around the world

2.4.1 WASH in Schools Programme in Kenya

The WASH in Schools Programme in Kenya, implemented by UNICEF and the Kenyan government, has successfully improved access to safe water, sanitation facilities, and hygiene education in schools.

In 2020, the UNICEF Kenya program focused on setting up WASH facilities in primary schools that are considerate of gender and disability issues, in part as a response to the COVID-19 pandemic, and community initiatives on menstrual hygiene management (MHM), benefiting over 15,000 adolescent girls who could not go to school because of the pandemic. The girls received reusable sanitary pads that could last over a year. Additionally, UNICEF provided

training for implementing partners to ensure they have the knowledge and skills to educate girls and women about MHM.

2.4.2 WASH in Schools India

India's WASH in Schools (WinS) initiative aligns with the global goal of ensuring every child can access a secure and healthy learning environment that promotes growth and development (UNICEF India, 2014). Launched in 2012, this initiative represents a collaborative effort involving 60 prominent global organizations dedicated to advancing WinS initiatives worldwide.

This initiative acknowledges the fundamental importance of adequate water, sanitation, and hygiene facilities in educational settings to ensure students can fully engage in their learning experiences. The initiative aims to create a conducive environment where students can thrive academically, socially, and physically by promoting access to clean water, proper sanitation facilities, and hygiene education.

2.4.3 The Enhanced Water, Sanitation, and Hygiene (WASH) Services in Schools and Communities initiative in Ghana

The Enhanced WASH Services in Schools and Communities initiative in Ghana was a 9,000 CAD program sponsored by UNICEF and the Canadian International Development Agency to improve access to clean water, proper sanitation facilities, and hygiene education in schools and communities nationwide.

This program addressed the challenges many Ghanaians face in accessing basic water and sanitation services, which are essential for overall health and well-being.

One key objective of the Ghana program was to ensure that the five most deprived regions have access to safe and clean water sources and adequate sanitation facilities. This is important because, without proper water and sanitation infrastructure, students and community members are at risk of contracting waterborne diseases such as cholera, diarrhea, and typhoid, which can have severe consequences for their health and academic performance.

Additionally, the WASH program focused on promoting good hygiene practices among students and community members. This includes educating them on the importance of handwashing, proper waste disposal, and other hygienic behaviors that can help prevent the spread of diseases.

2.5 Challenges Faced by Female Students in Managing Menstruation at School

2.5.1 Lack of access to water, sanitation, and menstrual supplies

Managing menstruation at school can be a challenging and often overlooked issue for many female students, especially in low-resource settings where access to water, sanitation, and menstrual supplies is limited (Article, 2017). The lack of adequate facilities and resources can have a significant impact on the physical and emotional well-being of female students, as well as their educational attainment.

According to the authors (Aluma & Ongom, n.d.), a significant hurdle for female students in managing menstruation at school is inadequate access to clean water and sanitation facilities. In numerous schools, especially in rural or underprivileged regions, functional toilets, and handwashing facilities may be lacking, posing challenges for girls in changing menstrual products and upholding proper hygiene during their periods. This deficiency can result in discomfort, embarrassment, health concerns, and an increased vulnerability to infections among female students.

In addition to inadequate water and sanitation facilities, many female students also struggle with a lack of access to menstrual supplies such as pads or tampons (Jaafar et al., 2023). In some cases, girls may not be able to afford these products or may not have easy access to them, leading to improvised solutions such as using rags or toilet paper. This can be uncomfortable and unsanitary and can also contribute to feelings of shame and stigma surrounding menstruation.

The combination of limited access to water, sanitation, and menstrual supplies can hurt female students' ability to participate in school activities fully. Girls may miss school or leave early during their periods due to discomfort or fear of leakage, leading to lower academic performance and higher dropout rates (Tegegne & Sisay, 2014). This can perpetuate a cycle of poverty and inequality, as girls who miss out on education are less likely to reach their full potential and break out of the cycle of poverty.

2.5.2 Stigmatization and Social Taboos Surrounding Menstruation

A study conducted by Chris Bobel, a professor at the University of Massachusetts Boston, highlights the impact of stigmatization and social taboos on the experiences of girls and women managing their periods (Bobel, n.d.). Bobel's research sheds light on how cultural beliefs and societal norms play a role in perpetuating the shame and secrecy surrounding menstruation, especially in developing countries.

In many societies, menstruation is viewed as impure or unclean, leading to discriminatory practices and restrictions on women and girls during their menstrual cycles. This stigma can lead to feelings of embarrassment, isolation, and low self-esteem among those who menstruate. Girls may be made to feel ashamed of their bodies. They may face restrictions on their daily activities, such as limitations on participation in religious practices, cooking, or even attending school.

The impact of this stigma is particularly pronounced in educational settings, where girls may face challenges in managing their periods discreetly and hygienically. The fear of leaks, odors, or visible menstrual products can lead to anxiety and stress, affecting their academic performance and overall well-being. Additionally, the lack of open conversations about menstruation perpetuates the cycle of shame and misinformation, further marginalizing girls and women.

Bobel's research underscores the need for comprehensive menstrual education programs that challenge stereotypes, debunk myths, and promote open dialogue about menstruation. By addressing the root causes of stigma and taboos surrounding menstruation, we can create a more inclusive and supportive environment for girls and women to manage their periods with dignity and confidence.

2.6 Existing Research on WASH Facilities and Menstrual Hygiene Management

2.6.1 WaterAid's Menstrual Hygiene Matters Report (2012)

The Menstrual Hygiene Matters Report, published by WaterAid in 2012, highlights the importance of Water, Sanitation, and Hygiene (WASH) facilities in encouraging the adoption of appropriate menstrual hygiene practices. The report highlights the significant obstacles faced by girls and women in low-resource settings, mainly due to the limited availability of clean water, proper sanitation facilities, and necessary hygiene products during menstruation. The report highlights the crucial role of clean water and sanitation infrastructure in enabling girls and women to manage menstruation hygienically and with dignity, emphasizing the importance of WASH facilities. The text emphasizes the impact of the lack of these facilities on personal hygiene and the overall health and well-being of individuals in these communities (House et al., n.d.).

2.6.2 A Time for Global Action: Addressing Girls' Menstrual Hygiene Management Needs in Schools

The study (Sommer et al., 2016) explores the potential effects of enhanced school WASH facilities on girls' menstrual health, attendance, and overall welfare. The study revealed a noteworthy improvement in girls' menstrual hygiene practices when schools provided separate toilets with water and soap facilities. Access to clean and private sanitation facilities with water and soap was essential for girls to manage their menstruation hygiene effectively and comfortably. This enhancement in WASH infrastructure directly contributed to improving girls' menstrual health and overall well-being.

In addition, the researchers noticed a significant decrease in girls' absenteeism after the introduction of upgraded WASH facilities in schools. The availability of proper sanitation facilities was crucial in addressing the challenges that girls encountered during menstruation, including physical discomfort, social embarrassment, and a lack of privacy. By addressing these challenges, the study showed that providing appropriate WASH infrastructure positively affected girls' school attendance rates.

2.6.3 Menstrual hygiene management in Ugandan schools: An investigation of low-cost sanitary pads" delved into the effects of introducing affordable sanitary pads on girls' menstrual hygiene practices in school settings

The study conducted by Girod and colleagues in Uganda provides valuable insights into the importance of accessible and affordable sanitary pads in helping girls manage their menstrual hygiene effectively. The research highlighted the significance of addressing economic barriers that often hinder girls from effectively managing their periods (Girod et al., 2017). It focused on the impact of low-cost menstrual products on girls' experiences during menstruation. The study offered valuable insights into the relationship between low-cost sanitary pads, menstrual hygiene management, and school attendance among girls. The research emphasized the significance of comprehensive strategies to tackle menstrual health challenges and enhance the well-being of girls in school settings by studying the impact of affordable menstrual products in the context of WASH interventions.

2.7 Findings on the Impact of Improved WASH Facilities on Menstrual Hygiene Practices

Improving Water, Sanitation, and Hygiene (WASH) facilities substantially impacts menstrual hygiene practices, particularly for girls and women living in environments with limited resources (Usman Adam et al., 2023). The research findings regularly reveal several positive effects that have resulted from improved WASH infrastructure and hygiene education and awareness campaign.

The management of menstrual hygiene practices among girls and women has been positively influenced by the improvement of WASH facilities, which include access to clean water and private sanitation facilities (R. Kaur et al., 2018). The availability of clean water makes it possible to wash and clean menstruation materials appropriately, lowering the risk of infections and alleviating discomfort. Girls are afforded the required privacy and dignity during menstruation when they have access to restroom facilities that are both private and clean, as well as equipped with facilities for the disposal of menstrual waste (Jahan et al., 2020).

Moreover, suitable handwashing facilities near restrooms encourage accurate hygiene habits before and after changing menstruation materials, reducing the likelihood of infections (Pu et al., 2022). Increased awareness of menstrual hygiene and breaking misconceptions and taboos around menstruation are both important goals that can be accomplished by implementing hygiene education programs that accompany better WASH facilities (Mumtaz et al., 2019).

An article by UNICEF in Nigeria in 2022 emphasizes the significant benefits for girls when they have better access to water, sanitation, and hygiene facilities. This improved access increases their likelihood of attending school regularly, even during menstruation. This is because they feel more comfortable and competent in controlling their periods. Better management of menstrual hygiene has also been linked to improved educational results, such as enhanced academic achievement and reduced the number of girls who drop out of school.

In conclusion, the findings shed light on the significant impact of improved WASH facilities in encouraging menstrual hygiene practices among girls and women, ultimately improving their health, well-being, and educational attainment. Assuring that girls can manage their menstruation in a manner that is both sanitary and respectful requires long-term investments in water, sanitation, and hygiene (WASH) infrastructure and hygiene education.

2.8 Government Policies and Programmatic Responses to Address Menstruation-Related Challenges

2.8.1 Menstrual Hygiene Management Guidelines for Schools in India (UNICEF India, 2014)

The Menstrual Hygiene Management Guidelines for Schools, issued by India's Ministry of Health and Family Welfare, demonstrate a praiseworthy initiative to promote good menstrual hygiene practices among school-going girls. The guidelines emphasize the importance of creating a supportive environment where girls can manage their menstrual cycles comfortably and hygienically at school.

The guidelines emphasize the importance of supplying menstrual hygiene products, like sanitary pads, to girls. This ensures they can access clean and safe materials to manage their periods effectively. In addition, the guidelines highlight the significance of having proper menstrual disposal facilities to prevent pollution and ensure cleanliness.

Furthermore, the guidelines emphasize the importance of maintaining privacy and dignity for girls during menstruation. They strongly recommend the provision of private and hygienic toilets equipped with facilities for washing and changing sanitary pads. The text effectively emphasizes the importance of educating girls about menstrual health, including proper hygiene practices, understanding the menstrual cycle, and debunking misconceptions and stigmas about menstruation.

These guidelines are instrumental in promoting menstrual hygiene practices and ensuring that girls can attend school without any hindrance due to menstruation. They provide a comprehensive framework for schools to follow.

2.8.2 The Menstrual Hygiene Management Policy for Kenya (NIXON, 1953)

In Kenya, menstrual hygiene management is a critical issue that affects the health, education, and well-being of girls and women across the country. The Kenyan government has recognized the importance of addressing this issue and has developed a Menstrual Hygiene Management Policy to guide efforts in promoting menstrual health and hygiene. The Menstrual Hygiene Management Policy for Kenya aims to ensure that all girls and women have access to the necessary information, products, and facilities to manage their periods safely and with dignity. The policy emphasizes the importance of providing comprehensive menstrual hygiene education in schools and communities to raise awareness and dispel myths and taboos surrounding menstruation.

One key aspect of the policy is providing sanitary products to girls and women who cannot afford them. The government has implemented initiatives to distribute free or subsidized sanitary pads to schoolgirls in need, ensuring they can attend school regularly and thoroughly participate in their education. It also calls for adequate water, sanitation, and hygiene (WASH) facilities in schools and public places to ensure that girls and women have a safe and private space to manage their periods.

The Menstrual Hygiene Management Policy also emphasizes engaging with communities, parents, teachers, and healthcare providers to promote open discussions about menstruation and break down associated stigmas. The policy aims to empower girls and women to manage their periods confidently and comfortably by creating a supportive environment that values menstrual health and hygiene.

Kenya's Menstrual Hygiene Management Policy reflects the government's commitment to promoting menstrual health and hygiene as a fundamental human right. By implementing this policy effectively, Kenya can improve the lives of girls and women by ensuring they have the resources and support they need to manage their periods with dignity and without barriers.

2.8.3 The National School WASH Minimum Standards of Ethiopia (MOE-Ethiopia, 2017)

The National School WASH Minimum Standards of Ethiopia provide a comprehensive set of guidelines to ensure that all schools in the country have access to sufficient water, sanitation, and hygiene facilities. The Ministry of Education worked closely with various stakeholders, such as the Ministry of Health, UNICEF, and other partners, to develop these standards.

The National School WASH Minimum Standards ensure that every school has access to clean and safe drinking water. Providing handwashing facilities with soap and water and adequate toilet facilities that are gender-segregated and accessible to all students, including those with disabilities, is essential. Schools also need an effective waste disposal system covering solid and wastewater to ensure safety.

The National School WASH Minimum Standards emphasize addressing infrastructure needs and promoting proper hygiene practices among students and staff. The curriculum greatly emphasizes teaching students the importance of handwashing, maintaining proper sanitation, and practicing good personal hygiene. Schools are also encouraged to implement hygiene promotion programs involving students, teachers, and parents in promoting healthy behaviors.

In addition, the National School WASH Minimum Standards also cover concerns regarding menstrual hygiene management, guaranteeing that schools are equipped with the necessary facilities and resources to support girls during their menstruation. It is essential to ensure that girls can access separate toilets, sanitary pads, and proper disposal facilities.

The National School WASH Minimum Standards of Ethiopia are carefully crafted to guarantee that every school offers a secure and conducive environment for students to excel and flourish. Implementing these standards can positively impact schools by preventing the spread of disease, boosting attendance rates, and promoting the overall well-being of students and staff.

2.9 Non-governmental organization (NGO) interventions to improve WASH Facilities

Non-governmental organizations (NGOs) are vital in improving water, sanitation, and hygiene (WASH) facilities in countries worldwide. These organizations are committed to addressing the challenges of clean water access, sanitation, and hygiene practices, particularly in underserved and marginalized countries. NGOs strive to make a positive difference in the health and well-being of individuals and communities through various interventions and programs (WHO, 2018).

NGOs are crucial in enhancing WASH facilities by focusing on infrastructure development. Numerous countries face the challenge of limited access to clean water sources, proper sanitation facilities, and hygiene resources. NGOs play a vital role in promoting sustainable solutions through infrastructure development, which ultimately enhances the quality of life for community members (Willets et al., 2008).

In addition to infrastructure development, NGOs also prioritize behavior change interventions to promote the adoption of good hygiene practices within communities. Education and awareness campaigns are essential in these interventions as they effectively educate community members about the importance of handwashing, proper sanitation, and safe water practices (Kanwal et al., 2022). NGOs often work with local leaders, schools, and health workers to establish hygiene promotion programs to encourage community members to adopt healthy behaviors. By sharing knowledge and fostering skills in WASH practices, NGOs have a vital role in reducing the spread of diseases and improving overall health outcomes.

NGOs advocate for policy changes and mobilize resources to support initiatives concerning water, sanitation, and hygiene (WASH) (UNICEF's Strategy for Water, 2016). Many non-governmental organizations are actively engaged in community-level initiatives to raise awareness about the importance of WASH facilities and advocate for government intervention to meet the needs of marginalized communities. NGOs can influence policy decisions, secure

funding for WASH projects, and promote sustainable solutions that benefit vulnerable populations. NGOs often collaborate with government agencies, international organizations, and other stakeholders to pool resources and expertise to implement WASH programs successfully.

Furthermore, NGOs prioritize the inclusion of marginalized groups, such as women, children, persons with disabilities, and refugees, in their WASH interventions (Disability-Inclusive and Accessible WASH Services for Refugees in Jordan, n.d.). These populations often face difficulties accessing clean water and sanitation facilities, heightening their susceptibility to waterborne diseases and other health risks. NGOs work diligently to ensure that their programs are inclusive and equitable, considering the distinct needs and vulnerabilities of different groups within communities. With a keen eye on inclusivity, NGOs play a vital role in addressing the issue of unequal access to WASH facilities and promoting social justice and equality.

2.10 Case Study: Assessing the Status of WASH Facilities in Montserrado County, Liberia:

2.10.1 Overview of the current situation in Montserrado County

In impoverished nations, managing menstrual hygiene is essential for teenage girls' health, well-being, and educational opportunities (Sommer et al., 2016). Menstrual hygiene is essential, but it has not gotten the attention it needs in Liberian classrooms. Teenage girls in underdeveloped nations frequently struggle to maintain their menstrual hygiene because of several issues, including restricted access to sanitary products, subpar sanitation facilities, and a lack of information about menstrual hygiene management. As a result, many girls miss school or drop out altogether, which can have long-term consequences on their education and prospects. Moreover, poor menstrual hygiene can lead to various health issues, such as reproductive tract infections, urinary tract infections, and other complications. Therefore, addressing menstrual hygiene management is essential to promote the health and education of adolescent girls in developing countries.

The Liberian EMIS Report 2014 reveals that many primary and secondary schools face challenges with their water facilities, and many lack separate bathrooms for boys and girls. The absence of Water, Sanitation, and Hygiene (WASH) in schools threatens the well-being and survival of vulnerable students.

Limited access to safe drinking water, insufficient sanitation services, and poor hygiene practices adversely impact students' overall health, academic performance, and development, leading to learning difficulties and school absenteeism.

The Nationwide Assessment of WASH Facilities in Schools Report in Liberia, conducted in March 2016, underscores the importance of access to WASH facilities for student well-being. The assessment covered both public and non-public primary and secondary schools nationwide. Collaborating with WASH and education sector partners, including civil society organizations, the assessment utilized the comprehensive EMIS dataset containing information on 5,517 schools in Liberia. The findings emphasize the need for targeted interventions to address the existing challenges and ensure the provision of adequate WASH facilities in schools throughout the country.

This report underscores the critical need for every child to access a secure and hygienic learning environment, including proper Water, Sanitation, and Hygiene (WASH) services. Inadequate WASH facilities, especially in schools in Liberia, can have profound effects on the health and education of students, particularly adolescent girls facing challenges in managing menstrual hygiene. The report reveals that many schools in Liberia lack sufficient WASH facilities, with 43% lacking access to safe drinking water, 68% without handwashing facilities, and 78% lacking separate toilets for boys and girls. This deficiency in WASH facilities contributes to poor hygiene practices and the spreading of diseases and infections.

Moreover, the report emphasizes the substantial impact of the absence of WASH facilities on girls' education. A lack of access to sanitary products and proper sanitation facilities results in girls missing school during their menstrual periods, leading to increased absenteeism and dropouts. This has a detrimental effect on their overall education and prospects. Efforts are needed to address these challenges and ensure that schools provide adequate WASH facilities to create a conducive learning environment for all students, particularly girls.

2.10.2 The Importance of WASH Facilities in Schools

The importance of WASH facilities in schools cannot be overstated (Usman Adam et al., 2023). Access to clean water, sanitation, and hygiene facilities is essential for promoting good health, improving attendance rates, enhancing academic performance, promoting gender equality, and encouraging good hygiene practices among students.

It is essential to grasp the connection between WASH facilities and menstrual hygiene management (MHM) in schools to ensure that menstruating girls are not faced with challenging decisions due to poor sanitation conditions. According to a report by UNICEF, UNESCO, and WHO, there is a crucial link between insufficient WASH facilities in schools and the adverse effects on girls' MHM. This results in increased absenteeism and ultimately leads to dropouts.

The report states that girls who do not have access to adequate WASH facilities during menstruation may feel embarrassed or uncomfortable, leading them to miss school during their periods. This can result in a loss of up to 20% of school days per year for girls, which can have long-term consequences on their education and prospects.

Furthermore, poor access to sanitary products and adequate sanitation facilities can lead to poor menstrual hygiene, resulting in infections and other health problems (Idoko et al., 2023). Girls may resort to using unhygienic materials such as rags, leaves, or even soil during menstruation, which can cause infections and other complications.

Addressing the lack of access to WASH facilities in schools is crucial for promoting good MHM practices among girls (Hussain, 2014). This includes providing separate toilets for boys and girls, handwashing facilities, and access to sanitary products such as pads or tampons. It also involves educating girls about menstrual hygiene management and breaking the stigma surrounding menstruation.

2.10.3 Availability of WASH Facilities in Montserrado

Research by Joy et al. (2023) underscores the critical importance of access to safe WASH facilities for the health and well-being of students in schools. Adequate WASH facilities are crucial to ensure students have access to clean water and proper sanitation, promoting a healthy learning environment and reducing the spread of diseases. Despite recent improvements in Montserrado, there remains a significant gap between the demand and supply of WASH facilities in schools. A 2019 report by the Liberia WASH Consortium reveals that only 29% of schools in Montserrado have access to safe drinking water, and only 21% have adequate sanitation facilities. This lack of access can lead to poor hygiene practices, contributing to the spread of diseases and high absenteeism rates among students. In response to this challenge, organizations like Water Aid Liberia have implemented WASH programs in Montserrado, constructing hand-washing stations, toilets, and water points in several schools to improve access to these essential facilities.

2.11 Water Supply

2.11.1 Water Sources

According to UNICEF, Water sources in Liberian schools encompass hand pumps, wells, rainwater harvesting systems, and piped water systems. Hand pumps and wells, relying on groundwater extraction, are predominant, particularly in rural areas lacking piped water systems. Rainwater harvesting systems are utilized in regions with substantial rainfall, collecting and storing rainwater for later use. Piped water systems, the most reliable option, are limited to urban areas with municipal water supply systems. Despite these sources, water availability and quality vary widely among schools. Not all schools with water access have functional hand pumps or wells, leading to challenges for students and staff when attempting to access water due to malfunctioning or broken equipment.

2.11.2 Access to water in schools

Access to water in Liberian schools has posed a longstanding challenge, leading to health issues and diminished student academic performance. A 2018 study by UNICEF and the Liberian Ministry of Education highlighted the persistent problem, revealing that only 30.9% of assessed schools had on-premises water access. Disparities were observed, with non-public schools (40.3%) outperforming public schools (20.7%) due to their superior resources. Urban schools (50%) also fared better than their rural counterparts (25%) in water accessibility, attributed to their proximity to water sources or piped water systems. Efforts are needed to address these discrepancies and enhance school water availability, fostering a healthier and more conducive learning environment.

2.11.3 Sanitation of School in Montserrado County

Concerns and attempts to improve school sanitation have centered on Montserrado County, Liberia. Access to sanitary facilities is essential for students' health, well-being, and academic success. Every school in the county has improved access to handwashing stations and toilets as part of an ongoing effort to improve the sanitation infrastructure.

Even with advancements, problems still exist. According to a Liberia WASH Consortium report from 2019, only 21% of Montserrado schools had functional restrooms. Poor hygiene habits among students can result from inadequate sanitation, which can spread illness and absenteeism. Several organizations—including Water Aid Liberia—have implemented WASH programs to address these issues. The main goal of these projects is to construct and renovate

sanitary amenities, such as handwashing stations and toilets, at schools throughout Montserrado County. The objective is to guarantee that students can access hygienic and clean facilities to establish a healthy and favorable learning environment.

Efforts are still being made to improve school cleanliness, closing the gap between supply and demand and giving Montserrado County pupils a healthier and more favorable learning environment.

2.12 Access to latrines in schools

Access to latrines in schools in Liberia is still a significant challenge, particularly in rural areas. According to UNICEF, only 17% of schools in Liberia have access to basic sanitation facilities, such as latrines. This lack of access hurts students' health and education.

The situation is particularly dire for girls, who often miss school during their menstrual cycles due to the lack of private and hygienic sanitation facilities. This not only affects their education but also puts them at risk of health problems.

According to the WinS Assessment Report, most schools (3,532 or 69.1 percent) had latrine facilities. Latrine availability varied between public schools, with a higher percentage in urban schools (75.5 percent) than in rural schools (50.4 percent). However, it is worth noting that private schools had significantly higher access to latrines.

The government and non-governmental organizations are trying to improve access to sanitation facilities in public schools. For example, the Liberia WASH Consortium, a group of NGOs, is working to provide latrines and handwashing stations in schools nationwide. The government is also implementing a National School WASH Strategy (NSWS) to improve school access to water, sanitation, and hygiene facilities.

2.12.1 Public Schools Latrines in Liberia

In Liberia, public schools often have inadequate and unsanitary latrines, which pose a significant health risk to students and teachers. According to UNICEF, only 17% of schools in Liberia have access to basic sanitation facilities, and only 6% have access to handwashing facilities with soap and water.

The most common type of latrine found in public schools in Liberia is the pit latrine. These latrines are often poorly constructed and lack proper ventilation, which can lead to the spread of diseases such as cholera and diarrhea. The pits are often shallow and fill up quickly, leading to overflowing and contamination of nearby water sources.

In some schools, students may resort to open defecation due to the lack of proper latrines. This can lead to the spread of diseases and can also put students at risk of harassment or assault.

The Liberian government has launched initiatives to improve school sanitation facilities to address this issue. The Ministry of Education has set a target to provide access to basic sanitation facilities in all schools by 2030. UNICEF is also working with the government to construct improved school latrines, including VIP latrines and handwashing stations.

2.12.2 Private Schools Latrines in Liberia

Private schools in Liberia typically have latrines constructed to provide safe and sanitary bathroom facilities for their students. However, These latrines are essential for maintaining the health and well-being of students and staff members, as access to proper sanitation facilities is crucial for preventing the spread of diseases. (SWA, 2022)). The construction and maintenance of latrines in private schools in Liberia are guided by the Ministry of Education's standards and regulations, which outline specific requirements for the design, size, and location of latrines on school premises. These standards ensure that latrines are safe, hygienic, and accessible to all students.

2.12.3 Toilet facilities that incorporate menstrual hygiene components

Toilet facilities that incorporate menstrual hygiene components are designed to cater to the specific needs of menstruating individuals, ensuring they have access to clean, safe, and dignified facilities to manage their periods hygienically and comfortably. These facilities go beyond traditional toilets, including features addressing menstrual hygiene management (MHM) requirements(Olukanni, 2013). Here is a detailed overview of the components typically found in such facilities:

- i. **Menstrual Hygiene Product Disposal Bins:** One critical component of toilet facilities that incorporate menstrual hygiene is the provision of disposal bins for used menstrual hygiene products such as pads, tampons, or menstrual cups. These bins are strategically placed within the facility, allowing users to dispose of their used products discreetly and hygienically. Proper disposal of menstrual hygiene products helps prevent toilet clogging and maintains overall sanitation in the facility.
- ii. **Handwashing Stations:** Access to handwashing facilities with soap and water is essential for maintaining good hygiene during menstruation. Toilet facilities with menstrual hygiene components often include handwashing stations near the toilets to encourage proper hand hygiene practices. This helps prevent the spread of germs and infections, promoting overall health and well-being.

- iii. **Privacy Features:** Privacy is crucial for menstruating individuals to feel comfortable and secure while managing their periods. Toilet facilities with menstrual hygiene components typically include features such as lockable doors, adequate partitions between stalls, and sufficient lighting to ensure privacy and security. These features help create a safe and supportive environment for menstruating individuals to attend to their menstrual needs.
- iv. **Water and Sanitation Facilities:** Adequate water supply and sanitation facilities are essential for maintaining cleanliness and hygiene in toilet facilities. Facilities that incorporate menstrual hygiene components ensure access to clean water for flushing toilets, handwashing, and cleaning. Proper sanitation practices help prevent the spread of infections and promote overall hygiene within the facility.
- v. **Educational Materials:** Some toilet facilities may also include educational materials or posters that provide information on menstruation, proper hygiene practices, and the importance of using menstrual hygiene products correctly. These materials help raise awareness about menstrual health and hygiene, empowering individuals to make informed choices about their menstrual care.

2.13 Hygiene

2.13.1 Access to hand-washing Facilities in Liberia

Accessing adequate hand-washing facilities in schools is a critical public health concern in Liberia. This problem is especially noticeable in rural schools lacking infrastructure development.

Three factors contribute to the absence of hand-washing facilities in schools:

- i. **Infrastructure Limitations:** The country's infrastructure poses significant challenges regarding the availability of hand-washing stations. Some areas lack the basic plumbing and water supply systems to establish adequate hand-washing facilities.
- ii. **Economic Barriers:** Economic challenges further compound the problem, as the lack of sufficient financial resources makes building and upkeep the required facilities difficult.
- iii. **Rural vs. Urban Disparities:** There is a noticeable contrast between urban and rural schools. Although well-equipped, hand-washing facilities in urban schools still do not meet the desired standards. On the other hand, rural schools face a significant challenge regarding limited access, which affects many people.

2.14 Impact on Absenteeism Attendance and Academic Performance

Across the world, the issue of menstruation and menstrual hygiene insecurity has a significant impact on the education of countless girls and women, leading to increased school absenteeism and a higher risk of dropping out (Mohammed et al., 2020).

UNESCO reports that numerous adolescent girls are unable to attend school for various reasons, including menstrual cramping, inadequate menstrual hygiene materials, absence of water and sanitation facilities in schools, unsupportive environments, and the fear of experiencing a menstrual accident. Adolescents may avoid participating in class activities due to concerns about potential leaks, odors, and discomfort. Similarly, some may feel hesitant to write on the board due to worries about menstrual accidents and the embarrassment that could follow if others were to see blood on their clothes.

In Liberia, access to adequate Water, Sanitation, and Hygiene (WASH) facilities in schools is crucial for addressing menstruation-related challenges faced by female students. The availability of clean and safe toilets with menstrual hygiene components can have a significant impact on attendance and academic performance among menstruating individuals in Liberian schools. Let us delve into the specific issues and potential solutions related to WASH facilities and menstrual hygiene management in this context:

- i. **Attendance Challenges:** In many schools in Liberia, female students face barriers to attending classes regularly due to inadequate WASH facilities that cater to their menstrual hygiene needs. Without access to clean and private toilets, handwashing stations, and disposal facilities for menstrual products, girls may choose to stay home during their periods to avoid discomfort, embarrassment, or health risks. This can increase female students' absenteeism rates, impacting their overall educational experience and academic progress.
- ii. **Impact on Academic Performance:** The lack of proper WASH facilities in schools can also affect the academic performance of menstruating students in Liberia. When girls miss school days due to menstruation-related issues or discomfort, they may fall behind in their studies, struggle to keep up with assignments, and face challenges in understanding classroom lessons. This can impact their academic performance, grades, and educational outcomes, limiting their potential for success and advancement.

- iii. **Health Risks and Hygiene Concerns:** Inadequate school WASH facilities pose health risks and hygiene concerns for menstruating students in Liberia. Without access to clean water for washing hands, proper disposal options for menstrual products, and hygienic toilet facilities, girls may be at risk of infections, illnesses, and other health issues related to poor menstrual hygiene management. This affects their physical well-being and impedes their participation in school activities and learning opportunities.
- iv. **Social Stigma and Cultural Taboos:** Menstruation-related challenges in accessing WASH facilities in Liberian schools are often exacerbated by social stigma and cultural taboos surrounding menstruation. Girls may feel ashamed or embarrassed to discuss their menstrual needs openly or seek support from teachers or peers. This can further isolate them from school activities, limit their interactions with classmates, and hinder their ability to focus on their studies.

CHAPTER 3: METHODOLOGY

3.1 Introduction

The chapter delves into an intricate description of research methodologies, encompassing data collection and management techniques and the simulation tools utilized across four case studies. Emphasized within is the utilization of the Kobo Toolbox and its relevance to the study's objectives. Specifically, the investigation scrutinizes the conditions of water and sanitation facilities at research sites, focusing on the cleanliness and functionality of toilets and water systems. The aim is to mitigate the stigmatization faced by females when menstruating in various campus settings.

In addition to menstruation-related stigmatization, the study probes into other contributing factors, such as bathroom cleanliness and water quality, that are contextual to the respective areas. This comprehensive approach involves site visits and interviews with students and faculty to ascertain the prevailing WASH (Water, Sanitation, and Hygiene) conditions. Qualitative and quantitative research methodologies provide a holistic understanding of the situation, culminating in recommendations tailored for stakeholders and developmental partners within the WASH sector.

The study proposes a model through the Kobo Toolbox to enhance WASH systems within school facilities, thereby bolstering their resilience. The chapter's conclusion furnishes detailed insights into these schools' setups and the data gathered throughout the research process.

3.2 Research Design

Research design naturally encompasses multiple disciplines (Mujere, 2016).

The research design employed in this study is a mixed-method approach, integrating both quantitative and qualitative methodologies to investigate the complex dynamics surrounding the Water, Sanitation, and Hygiene (WASH) conditions in various school facilities. This hybrid approach was chosen to comprehensively address the multifaceted nature of the research objectives outlined in the thesis.

The research design facilitates a multifaceted exploration of the WASH conditions in the selected research sites by combining numerical data analysis with interviews. The quantitative component allows for systematically examining statistical trends and patterns related to water quality, sanitation facilities' cleanliness, and overall WASH infrastructure robustness. This

numerical analysis provides empirical evidence to support the research findings and conclusions.

On the other hand, the qualitative component, conducted through interviews with students and faculty members, offers a deeper understanding of the lived experiences, perceptions, and challenges faced regarding WASH conditions in school environments.

By integrating numerical and interview-based approaches, the research design aligns with the thesis objectives of comprehensively understanding WASH conditions in school facilities and identifying potential strategies to mitigate stigmatization, particularly among female students. This mixed-method approach ensures that the research findings are robust and nuanced and reflect the complex realities, enhancing the credibility and applicability of the study's outcomes.

3.3 Description of Study Area

Montserrado County, located in western Liberia and bordered by the Atlantic Ocean, encompasses Monrovia, Liberia's capital. Its diverse population includes ethnic groups such as the Kpelle, Bassa, and Vai, who are attracted by the county's economic opportunities. Montserrado is Liberia's economic hub, hosting significant industries, government institutions, and international organizations. The county's infrastructure, including roads and an international airport, supports its vital role in trade and commerce. It also boasts a significant educational and healthcare infrastructure, catering to its residents and others across Liberia.

With a rich historical and cultural heritage, Montserrado faces challenges like poverty, inadequate rural infrastructure, and environmental issues despite its economic prominence. However, like many regions worldwide, Montserrado County faces significant challenges related to menstrual hygiene management (MHM) in schools. This research examines two public schools, William V.S. Tubman High School and Garretson Wilmot Gibson High School, both in Montserrado County, Liberia. Additionally, two private schools, Joseph Jenkins Roberts United Methodist School and John G. Mills High School, are included. These schools offer diverse perspectives on water, sanitation, and hygiene (WASH) conditions. The study aims to comprehensively analyze WASH challenges and opportunities in educational settings across Montserrado County.



Figure 3.1: Study Area Map

3.4 Data Collection Method

The outcome of a research project often hinges on the quality of data collection (Taherdoost, 2021). Data collection on the status of water, sanitation, and hygiene (WASH) facilities in schools, particularly regarding the menstruation-related challenges female students face, is essential for identifying gaps and implementing targeted interventions. One effective method of data collection was administering questionnaires among female students. Those questionnaires inquired about their experiences with WASH facilities during menstruation, focusing on aspects such as the availability of clean water, functional toilets with privacy, proper disposal facilities for sanitary products, and access to necessary hygiene products.

In addition to the questionnaires, focus group discussions were held with school staff and administrators that provided valuable insights into the upkeep of WASH facilities, existing policies related to menstruation management, and the specific challenges encountered in ensuring adequate facilities for female students. Observations of the physical conditions of WASH facilities, including assessments of cleanliness, privacy levels, and accessibility, were also crucial for understanding the current situation at the schools.

Quantitative data were collected on the number of female students utilizing the WASH facilities, the frequency of maintenance and cleaning activities, and the availability of menstrual hygiene management resources to understand the overall scenario better.

By combining questionnaires, focus group discussions, observations, and quantitative data collection methods, stakeholders can gain a holistic view of the status of WASH facilities in schools and develop targeted strategies to address female students' menstruation-related challenges effectively. This multifaceted approach ensured that a thorough understanding of school environments' existing gaps and needs informs interventions.

3.4.1 School Selection

During the assessment period from January 14, 2024, to February 18, 2024, in Monrovia, Liberia, two private and two public schools were chosen to study in Montserrado County. The selection of schools was purposeful, aiming to explore distinctions between the prevalent types of school environments and within the specific region of Montserrado County, Liberia. The selection process for schools focused on specific criteria to ensure a representative sample. Firstly, schools were chosen based on their geographical location, with a preference for those in Montserrado County or the capital city of Monrovia.

The selected schools had to offer education up to the secondary level grades, ensuring that the study would encompass a broad range of age groups and educational levels. Finally, the schools were divided into two categories: public and private. This distinction allowed for comparing the two types of institutions, shedding light on potential resource differences, teaching methods, and student outcomes.

By selecting schools based on these specific characteristics, the study aimed to provide a comprehensive understanding of the educational landscape in Montserrado County and Monrovia, offering valuable insights for policymakers, educators, and other stakeholders in the field of education.

Table 3.1: Characteristics of Schools

| Name of Schools | Location of Schools | Type of School |
|--|--------------------------------|-----------------------|
| William V.S. Tubman High School | 12 th Street Sinkor | Public |
| G.W. Gibson High School | Capitol Bye-Pass | Public |
| Joseph Jenkins Roberts United Methodist School | 11 th Street Sinkor | Private |
| John G. Mills High School | Paynesville City | Private |

3.4.2 Activities

The activities conducted by this research were guided by the Liberia National Water, Sanitation, and Hygiene Commission (LNWSHC) and the Monrovia Consolidated School System (MCSS). Questions for qualitative data collection were created to investigate and understand the range of personal challenges and needs girls had during menstruation in the school setting. All activities included a segment allowing participants to make recommendations on how the school and government could improve girls' experiences at school.

Four hundred twenty participants from four (4) schools were engaged in the research activities. Focus Group Discussions (FGDs) were conducted with girls, boys, and administrators. In addition, observations were conducted at all four schools. FGDs with girls focused on typical experiences girls have at school while menstruating and on typical practices and beliefs. FGDs with boys and administrators were performed to scrutinize and expand on findings from the discussions with girls.

These methods facilitated a thorough examination of WASH conditions, providing quantitative and qualitative data to inform recommendations for improving campus hygiene practices and infrastructure. Authorization to carry out activities at schools was acquired from the (MCSS) and the respective administrators of each private school.

3.5 Sampling Techniques and Sample Size

Sampling plays a crucial role in research, allowing for more practical and cost-effective data collection than a complete population census. This is especially important when considering time limitations and the size of the population. This method is commonly employed to select a representative portion of a population to determine the characteristics or parameters of the entire population (Mujere, 2016).

When assessing the status of WASH facilities in schools to address menstruation-related challenges, it is crucial to implement a strong sampling technique and determine an appropriate sample size. This allows for valuable insights to be obtained from a diverse range of data sources, including both quantitative and qualitative data. Four schools, namely, Joseph Jenkins Roberts United Methodist School, William V.S. Tubman High School, John G. Mills High School, and G.W. Gibson High School, were selected randomly to ensure fairness and reduce bias. The sampling strategy and sample size are crucial in capturing the nuances of school WASH facilities and gathering meaningful data (Nanjundeswaraswamy & Divakar, 2021).

The target study population is 51,546 senior secondary female students across the seventeen districts in Montserrado county.

Based on the population, a sample size approximation was determined using Slovin's formula. The Slovin's formula is used to calculate the minimum sample size needed to estimate a statistic based on an acceptable margin. The formula is as follow:

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

where:

n = desired sample size

N = target population

E = the error allowed (0.05) by adopting 95% level of confidence

$$n = \frac{N}{1+N(e^2)} = \frac{51,546}{1+51,546(0.05^2)} = \frac{51,546}{129.865} \geq 397$$

A total sample size of 420 (a number greater than 397) distributed among the selected four schools is used in this research study for analysis.

3.6 Data Processing and Analysis

Efficient data processing and analysis are crucial components of any research project, as they are essential for uncovering insights and deriving relevant findings (Singh, 2021).

In the data analysis phase, Kobo Toolbox played a crucial role in streamlining the data collection and management process, ensuring data quality, and facilitating robust data analysis to identify critical trends and patterns related to WASH facilities in schools in Montserrado County, Liberia.

Kobo Toolbox provided data cleaning and validation features, ensuring the accuracy and consistency of the collected data. The platform allowed for setting constraints and validation rules in the digital forms, minimizing errors during data entry. This data validation process enhanced the dataset's quality, making it more reliable for analysis.

The software facilitated real-time data entry, enabling immediate access to the information collected in the field. This real-time feature was instrumental in monitoring progress and addressing any issues promptly.

Kobo Toolbox allowed collected data to be exported in an Excel file and enabled further data analysis using the Excel software tool.

3.7 Ethical Considerations

Adhering to ethical guidelines and respecting the autonomy and dignity of individuals is paramount in researching such personal and potentially stigmatized topics (Fleming & Zegwaard, 2018).

Ethical issues are critical in qualitative investigations due to their in-depth nature (Mohd Arifin, 2018). This is particularly crucial in qualitative investigations, which often involve in-depth exploration of personal experiences and sensitive topics.

Ethical considerations are paramount when assessing WASH facilities in schools to address menstruation-related challenges faced by female students. Maintaining confidentiality and privacy is essential to creating a safe space for participants to share their experiences openly and honestly. Obtaining informed consent from all individuals involved in the research process, including students, teachers, and school staff, was fundamental to respecting their autonomy and ensuring they were fully aware of the research objectives and potential implications.

Before the questionnaires were distributed, every participant signed a consent form. For those who did not understand the context of the exercise, the form's contents were verbally explained to ensure a complete understanding of the study's goals and their rights as participants. Subsequently, participants confirmed their agreement and consent to participate. These steps were taken to prioritize the participants' well-being and rights and maintain the integrity of the research findings.

CHAPTER 4: RESULTS AND DISCUSSION

4.1 Distribution of Study Participants

The study involved 420 participants from four different schools in Montserrado. The distribution of participants among these schools (Figure 4.1) is as follows:

- i. **GW Gibson High School:** GW Gibson High School had 100 participants interviewed, which translates to 23.8% and indicates a significant representation in the study.
- ii. **William VS Tubman High School:** The William VS Tubman High School had a notable presence of 100 participants, which approximates to 19.0% of the total participants.
- iii. **John G. Mills:** 120 individuals were interviewed, which accounts for 28.6% of the total participants. John G. Mills School had the highest representation among the four schools. This suggests that a substantial number of participants were from this school.
- iv. **Joseph Jenkins Roberts United Methodist School:** Like John G. Mills, Joseph Jenkins Roberts United Methodist School also had 120 individuals interviewed, accounting for 28.6% of the total participants. This school also had a significant number of participants in the study.

The distribution of participants among the four schools was relatively balanced, with John G. Mills and Joseph Jenkins Roberts United Methodist School having the highest representation at 28.6% each. This balanced distribution allowed for a diverse sample that could provide insights into the accessibility of WASH facilities and the challenges menstruating students face across different school settings in Liberia.

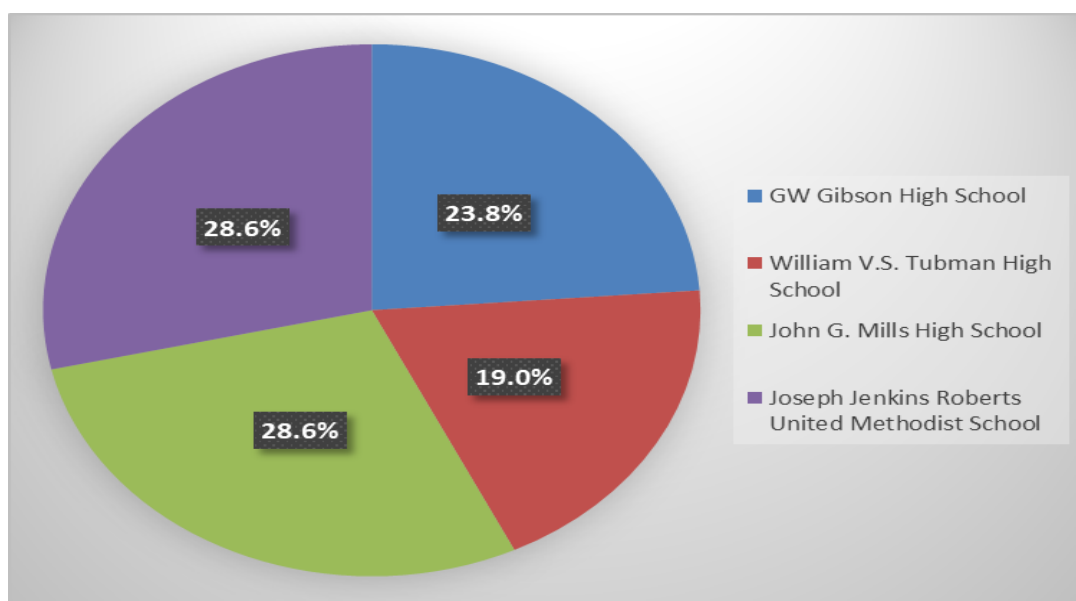


Figure 4.1: Percentage of students interviewed

4.2 Demographic characteristics of the study participants

The demographic characteristics of the study participants in the four schools reflected a diverse representation in terms of gender, age, grade level, and socioeconomic background. This diversity allowed for a comprehensive examination of the accessibility of WASH facilities and the challenges menstruating students face across different demographic profiles within the Liberian school context.

4.2.1 Grade level of students

In the study titled "Accessing WASH Facilities in Schools to Address Stigmatized Menstruating Students in Liberia," the focus was on students in grades 10th to 12th, with a particular emphasis on the 11th-grade class, with the highest number of students included in the research (Figure 4.2). Understanding that this group is crucial for academic and personal development, the study aimed to assess the accessibility and quality of WASH facilities in schools to address the challenges faced by menstruating students, especially in terms of stigma and discrimination. By highlighting the study's specific grade levels and student demographics, the research sought to provide targeted recommendations and interventions to ensure all students have equitable access to proper menstrual hygiene management resources and support within their educational environment.

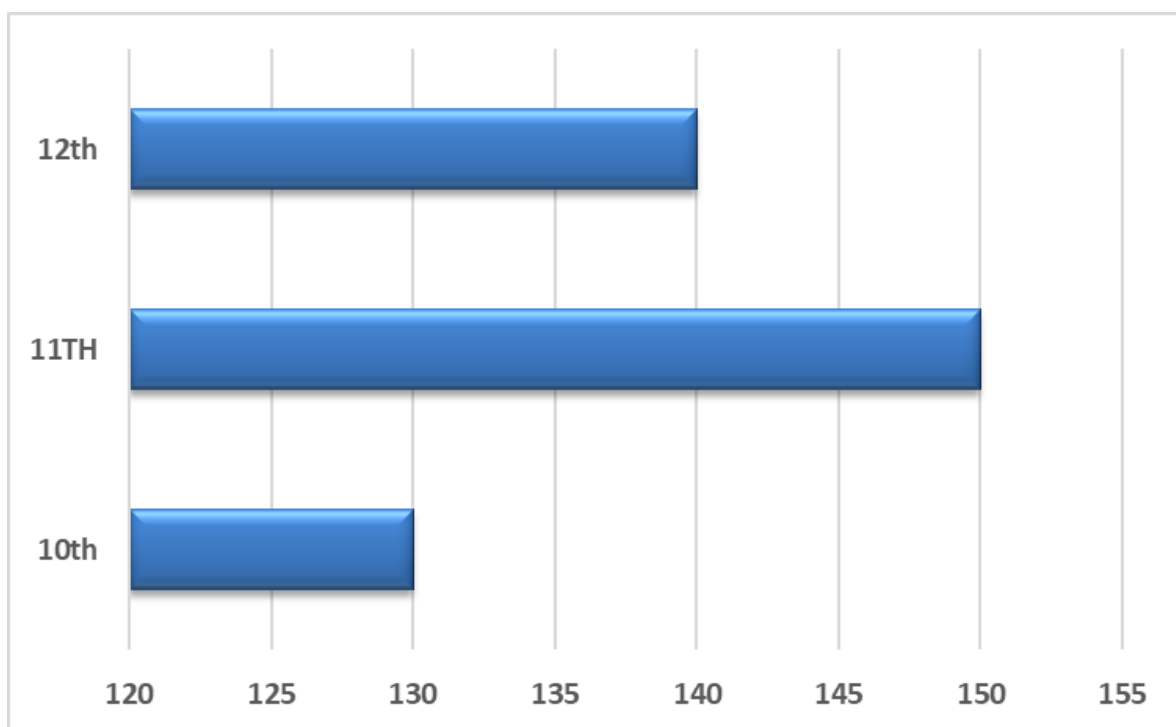


Figure 4.2: Class distribution of students

4.2.2 Age and Gender Factors

In the study focusing on accessing WASH facilities in schools to address menstruating students in Liberia, age and gender factors played a crucial role, as only females were involved in the research. By explicitly targeting female students in 10th, 11th, and 12th grade classes, the study recognized the unique challenges faced by adolescent girls during menstruation. Adolescence is a critical period marked by physical, emotional, and social changes, making it essential to address the specific needs of menstruating students within this age group (S. et al., 2020). Gender also played a significant role in the study, as societal norms and cultural taboos often stigmatize menstruation, leading to discrimination and barriers to accessing adequate WASH facilities. By focusing solely on females, the research aimed to shed light on the gender-specific challenges faced by menstruating students and advocate for targeted interventions to ensure their dignity, health, and well-being are prioritized within the school environment. The targeted female students are of the ages 12 to 22 years. It is noted that none of the students were of the age 13. The age distribution of the students are shown in Figure 4.3.

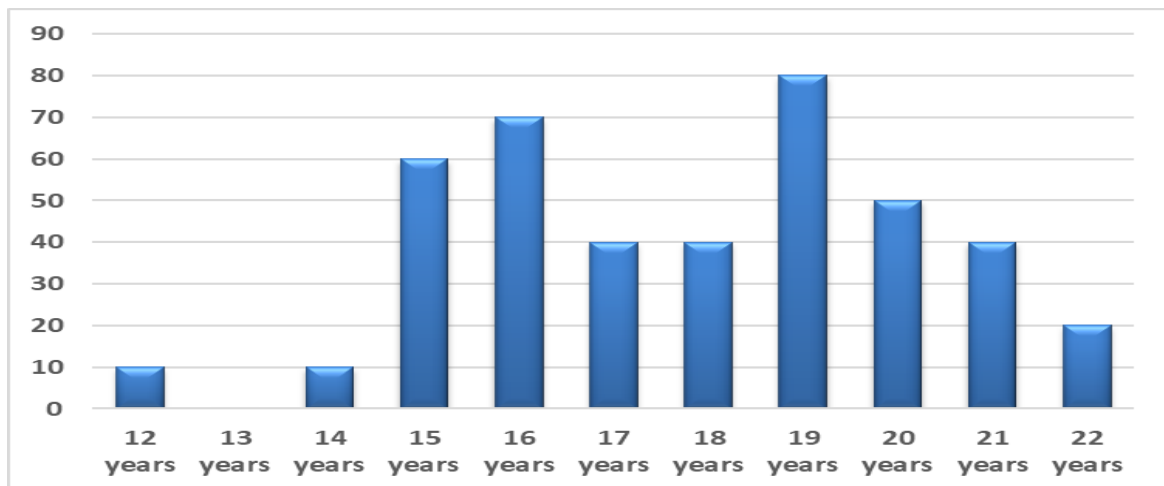


Figure 4.3: Age categories of students

4.3 Students' Knowledge of Menstrual Hygiene

The study also assessed students' knowledge about menstrual hygiene across different schools in Liberia. The percentages of students' knowledge levels varied among the schools surveyed (Figure 4.4). At GW Gibson High School, 23.8% of students understood menstrual hygiene practices well. In comparison, William VS Tubman High School had 19.0% of students knowledgeable about menstrual hygiene practices. John G. Mills High School and Joseph Jenkins Roberts United Methodist School had the highest percentage of students with sound knowledge at 28.6%.

These findings highlight the variations in students' awareness and understanding of menstrual hygiene practices across different schools. It is essential to ensure that all students have access to comprehensive education on menstrual hygiene to promote their health, well-being, and dignity. Targeted interventions and educational programs can help improve students' knowledge about menstrual hygiene and empower them to manage their menstruation with confidence and dignity.

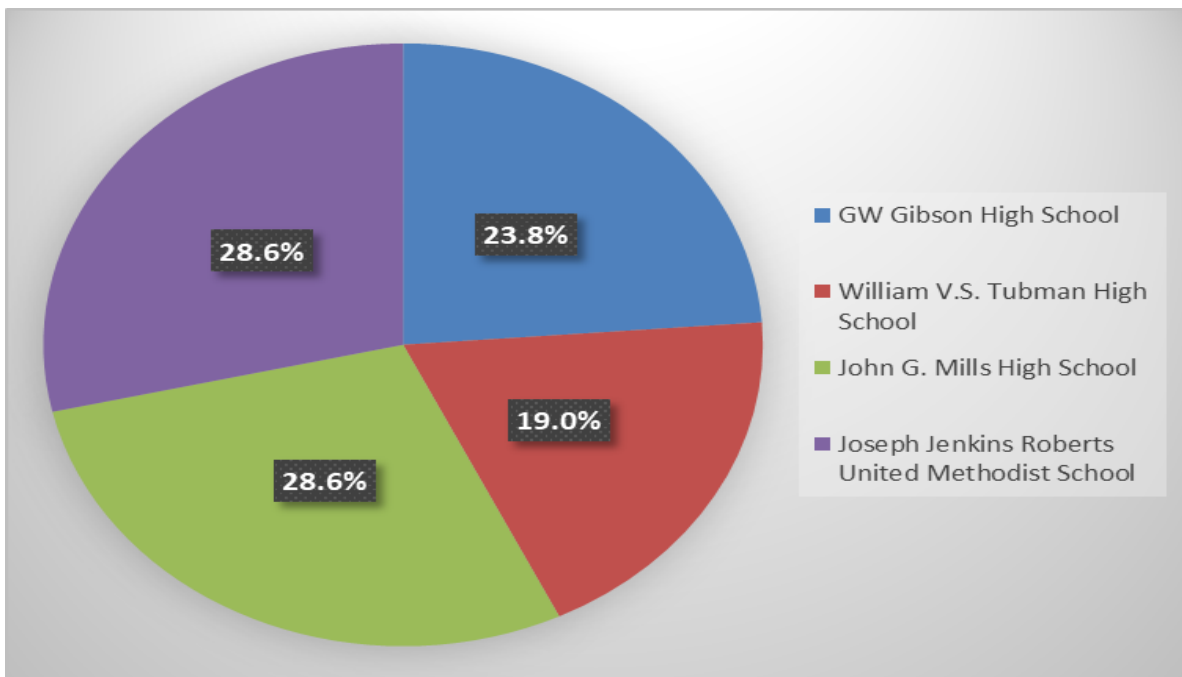


Figure 4.4: Students' knowledge of Menstrual Hygiene

4.4 Availability and Access to Menstrual Hygiene Products

4.4.1 Access to menstrual hygiene information

Access to information on menstrual hygiene is crucial for students' health and well-being. Since students rely on lectures in the classroom as their primary source of information (Table 4.1), it is essential to ensure that comprehensive and accurate information about menstrual hygiene is included in the curriculum. Teachers play a vital role in delivering this information effectively, addressing common misconceptions, promoting good hygiene practices, and providing guidance on managing menstruation with dignity.

In addition to classroom lectures, schools can also consider incorporating interactive sessions, workshops, and educational materials to enhance students' understanding of menstrual hygiene. By ensuring that all students have access to reliable information through classroom lectures, schools can empower students to make informed decisions about their menstrual health,

promote positive attitudes towards menstruation, and break the stigma surrounding this natural process.

Table 4.1: Access to menstrual hygiene for students

| Source | Number | Percent |
|--------------------------|--------|---------|
| Class Lecture | 420 | 100 |
| Health Club | 0 | 0 |
| Library | 0 | 0 |
| Media (Radio/Television) | 0 | 0 |
| Social media | 0 | 0 |

4.4.2 Availability of menstrual hygiene products

The availability of menstrual hygiene products in schools is a critical aspect of ensuring the well-being and dignity of students (Fatajo, 2024). However, it is concerning that in all the schools in this study, only sanitary pads are made available, neglecting students' diverse needs and preferences (Table 4.2). While sanitary pads are common for menstrual protection, some students may prefer other options, such as tampons, menstrual cups, or reusable cloth pads. Schools can cater to students' needs and preferences by offering various menstrual hygiene products, promoting inclusivity and accessibility.

The exclusive availability of sanitary pads may pose challenges for students who cannot afford them or have specific requirements due to health reasons. Schools should consider expanding their range of menstrual hygiene products to ensure that all students have access to suitable options.

Educating students on the use and benefits of different menstrual hygiene products can empower them to make informed choices about their health.

Table 4.2: Menstrual hygiene products available in schools

| Source | Number | Percent |
|---------------|--------|---------|
| Sanitary Pads | 420 | 100 |
| Menstrual Cup | 0 | 0 |
| Tampon | 0 | 0 |

4.4.3 Accessibility to menstrual products for students

The accessibility of menstrual products for students is crucial to promoting their well-being and ensuring they can manage their menstrual health with dignity. In a survey conducted among 420 students, varying levels of accessibility were reported. A concerning 23.8% of students (100 individuals) indicated that they had no access to menstrual products, highlighting a significant gap in meeting these students' basic needs. Additionally, 19.0% (80 students) reported slow access to menstrual products, indicating delays or challenges in obtaining them.

On a more positive note, 45.2% (190 students) mentioned having somewhat easy access to menstrual products, suggesting that efforts have been made to provide some support. Furthermore, 11.9% (50 students) reported effortless access to menstrual products, indicating higher availability and convenience.

These results and their correlated percentages (Table 4.3) underscore the importance of addressing the disparities in access to menstrual products among students. Ensuring all students have easy and reliable access to various menstrual hygiene products to meet their diverse needs and preferences is essential, ultimately promoting inclusivity and well-being in schools.

Table 4.3: Accessibility to menstrual products for students

| Number | Number | Percent |
|-----------------|--------|---------|
| Not at all | 100 | 23.81 |
| Very slow | 80 | 19.05 |
| Somewhat easily | 190 | 45.24 |
| Very easily | 50 | 11.90 |

4.5 WASH Facility Conditions

4.5.1 Cleanliness of Wash facilities

WASH facility conditions in schools play a crucial role in ensuring the health and well-being of students and staff (Repository, 2003). In the case of these four schools—GW Gibson High School and William VS Tubman High School are public schools, and Joseph Jenkins Roberts United Methodist School and John G. Mills High School are private schools—the disparities in funding and resources significantly impact the upgrading and maintenance of the schools' facilities.

The study on the cleanliness of school WASH (Water, Sanitation, and Hygiene) facilities revealed a concerning picture (Figure 4.5). Of the four schools surveyed, 45% of the respondents reported that the WASH facilities were fairly clean, indicating that some maintenance and hygiene practices were being followed. Only 7% of the respondents classified the facilities as having good cleanliness standards, suggesting that most of the facilities were not meeting the desired level of cleanliness.

A significant proportion of the respondents, 38%, reported to have poorly clean WASH facilities. This indicates noticeable lapses in cleaning and maintenance, potentially posing health risks to the students and staff using these facilities. Furthermore, 10% deemed the WASH facilities not clean, highlighting a critical issue in public school hygiene standards.

The disparity between public and private schools was evident in the findings, with public schools disproportionately represented in the poorly clean and not clean categories. This raises concerns about the resources and attention allocated to WASH facilities in public educational institutions. The study underscores the need for improved cleanliness standards in school WASH facilities, particularly in public schools, to ensure a safe and healthy environment for students and staff.

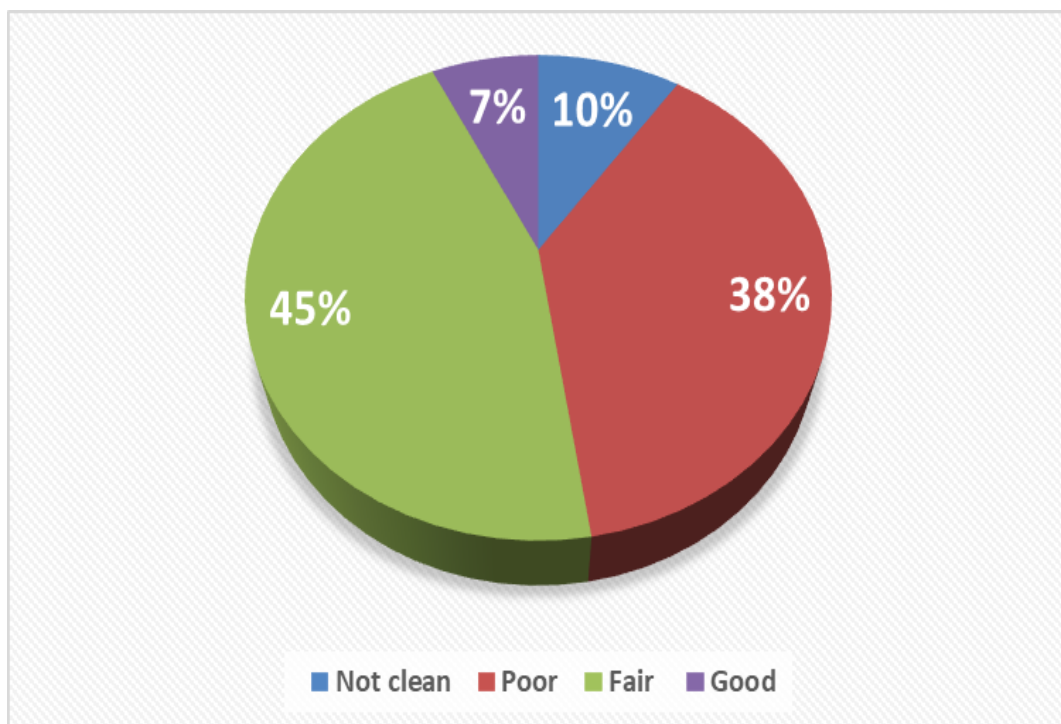


Figure 4.5 Cleanliness of WASH Facilities

4.5.2 Cleaning frequency of WASH facilities

Analyzing the cleaning frequency of WASH facilities in the schools reveals a concerning trend (Figure 4.6). The data shows that a significant % of the respondents, 55%, informed about their facilities being cleaned only twice a week, while 19% reported the facilities being cleaned once a week. This indicates that many schools are not maintaining a high frequency of cleaning for their WASH facilities, potentially leading to hygiene issues and health risks.

A mere 7% of the students indicated that they clean their facilities every month. This figure is cause for concern, as it raises questions about the cleanliness and sanitation of these vital educational spaces. Additionally, a concerning 5% of the participants told that they do not clean their WASH facilities, underscoring a significant deficiency in hygiene practices.

These findings suggest that improved cleaning protocols and more frequent maintenance of WASH facilities in schools are needed to ensure a safe and healthy environment for students and staff. Adequate resources and attention should be allocated to ensure that these facilities are cleaned regularly and effectively to prevent the spread of diseases and promote the well-being of students.

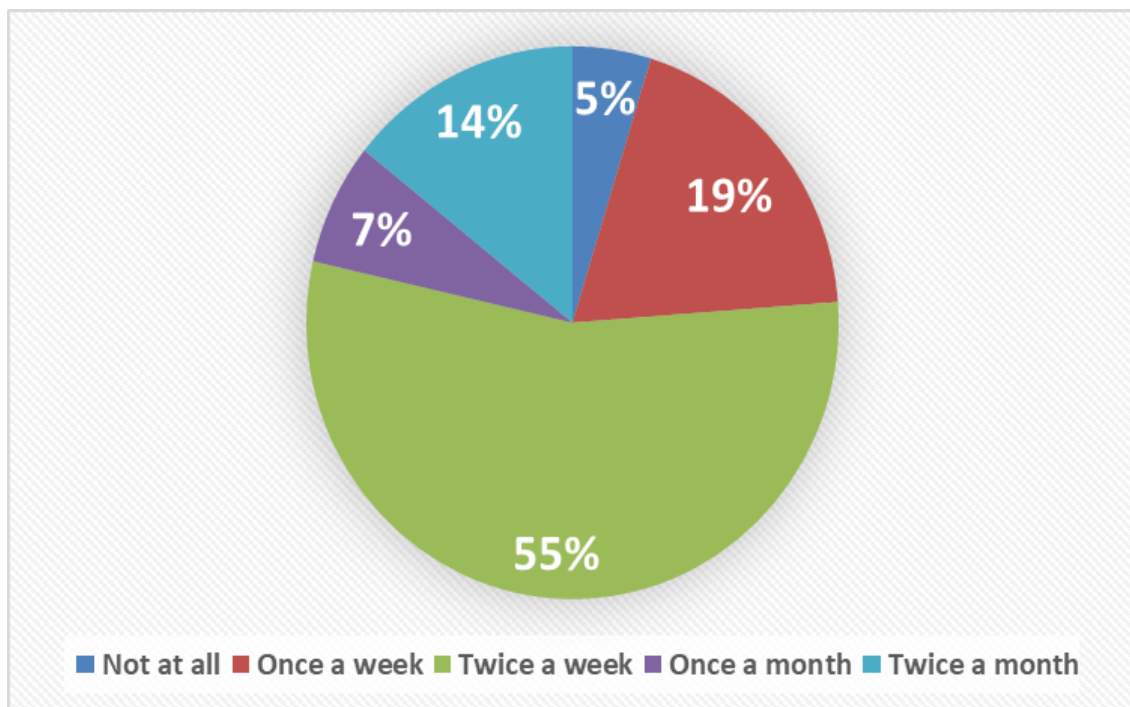


Figure 4.6 Cleaning Frequency of WASH Facilities

4.5.3 Probing WASH Facilities

Exploring the washing facilities in schools involves a detailed assessment of various aspects to ensure that they meet the necessary standards for hygiene, privacy, and inclusivity. To understand Table 4.4 below, these are breakdowns of the key questions and considerations related to probing the WASH facilities:

- i. Separate toilets for males and females in schools are essential to ensure privacy, dignity, and safety for all students. This segregation creates a comfortable environment for students to use the facilities without concerns about gender-related issues.
- ii. Providing separate WASH facilities for menstruating students is vital in addressing their specific needs during their period. These facilities should include adequate sanitary products, disposal bins, and access to clean water for personal hygiene. Ensuring privacy and comfort for menstruating students is essential for their well-being and dignity.
- iii. Handwashing is a critical step in preventing the spread of infections and diseases, and access to soap and water promotes good hand hygiene (Spruce, 2021)
Having a facility with soap and water near the toilet for handwashing is essential for maintaining proper hygiene practices. In the study, all the schools did not have hand washing stations, which exposed them to sicknesses and diseases.
- iv. Privacy in washrooms ensures students feel comfortable and safe using the facilities. Adequate partitions, doors, and locks should be in place to provide privacy for individuals using the toilets. Lack of privacy can lead to discomfort, embarrassment, and reluctance to use the facilities, impacting students' well-being.

Table 4.4: Probing WASH facilities

| Question | Yes/No |
|--|--------|
| Are there separate toilets for males and females? | Yes |
| Do you think there should be separate WASH facilities for menstruating students? | Yes |
| Is there a facility with soap and water near the toilet for washing hands? | No |
| Is there enough privacy in the washroom? | No |

4.5.4 Comfortability of Students During Menstrual Period

Students' well-being and academic performance can be significantly affected by their comfort during the menstrual period(Sanni, 2019). Promoting students' welfare and academic experience involves addressing their comfort and needs related to menstruation(Cotropia, 2019).

Based on the given percentages in Figure 4.7 below, a notable number of students (38%) express a lack of comfort, while 33% describe their comfort level as low. In addition, a significant portion of students, precisely 22%, reported that their menstrual experience is "manageable," whereas a smaller percentage, specifically 7%, express feeling "very comfortable." Many students face significant challenges during this time, as they struggle with feelings of discomfort, poor performance, and just managing to get by.

To ensure the well-being of students during their menstrual period, it is crucial to adopt a comprehensive approach(Gerlach & Brandt, 2021). This involves offering appropriate menstrual hygiene facilities, such as equipped WASH facilities for menstruating students, easy access to menstrual products, and ensuring privacy in washrooms. By fostering a nurturing atmosphere that recognizes and attends to the unique requirements of students who menstruate, educational institutions can enhance their comfort and enhance their overall welfare. It is crucial to prioritize students' perspectives, gain insight into their personal experiences, and enact measures that promote their sense of ease, dignity, and assistance throughout this inherent physiological phenomenon.

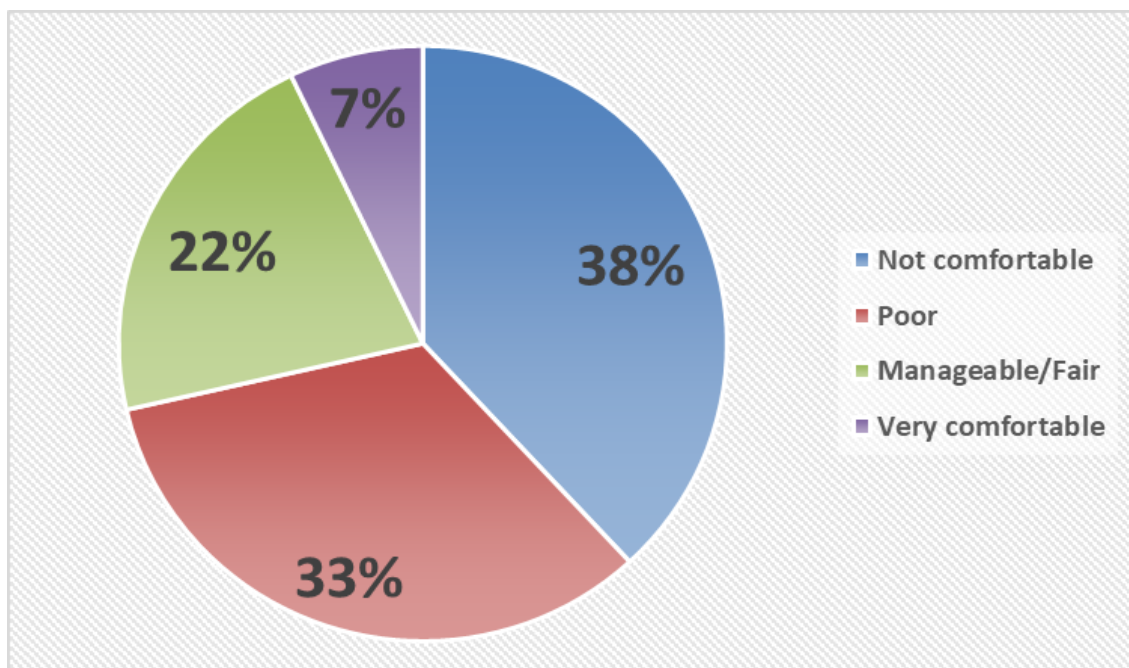


Figure 4.7: Comfortability Frequency during Menstruation

4.6 Peer Influence and related Stigmatization due to menstrual hygiene

According to an article done by (Kowalski and Chapple, 2000), stigmatization due to menstruation is a pervasive issue, impacting the well-being and educational experience of women and girls. To shed light on this issue, the focus group discussions with students from GW Gibson High School, William VS Tubman High School, Joseph Jenkins Roberts United Methodist School, and John G. Mills High School helped gather firsthand accounts of their experiences with menstrual stigmatization.

During the discussions, several common themes emerged regarding the stigmatization of menstruation in schools. Many students explained feeling embarrassed or ashamed about their periods, often due to societal taboos and a lack of open discussions about menstruation. Janet Gaye, a student of the 11th grade class of the GW Gibson High School, shared, "I feel like I have to hide my period at school because it is seen as something dirty or shameful."

In public schools where resources are limited, the lack of proper menstrual hygiene facilities exacerbates the stigma surrounding menstruation(K. Kaur et al., 2024). A student of the 12th grade class of William VS Tubman said, "Our school bathrooms are not well-maintained, and there are no disposal bins for sanitary products. It makes managing my period at school very challenging and uncomfortable."

Conversely, students from Joseph Jenkins Roberts United Methodist School and John G. Mills High School also reported experiencing stigmatization due to menstruation, albeit in different ways. Yvonne Johnson of the 10th-grade class of the John G. Mills High School narrated, "Even though our school has better facilities, there is still a sense of shame around menstruation. Some teachers and classmates make jokes or negative comments about periods, making me self-conscious."

The discussions highlighted the need for increased awareness and education about menstrual hygiene to combat school stigmatization. Students emphasized the importance of open conversations about menstruation, access to accurate information, and supportive environments to manage their periods with dignity.

The below figure shows a higher percentage of students who feel stigmatized during their menstrual flow.

To address stigmatization due to menstruation in both public and private schools, policymakers, educators, and parents must work together to create inclusive and supportive environments for female students. This includes promoting gender equality, providing access to menstrual hygiene resources, and fostering a culture of respect and understanding around menstruation. By amplifying the voices of students and raising awareness about the impact of menstrual stigmatization in schools, we can strive towards creating a more inclusive and empowering educational environment for all students, regardless of their gender.

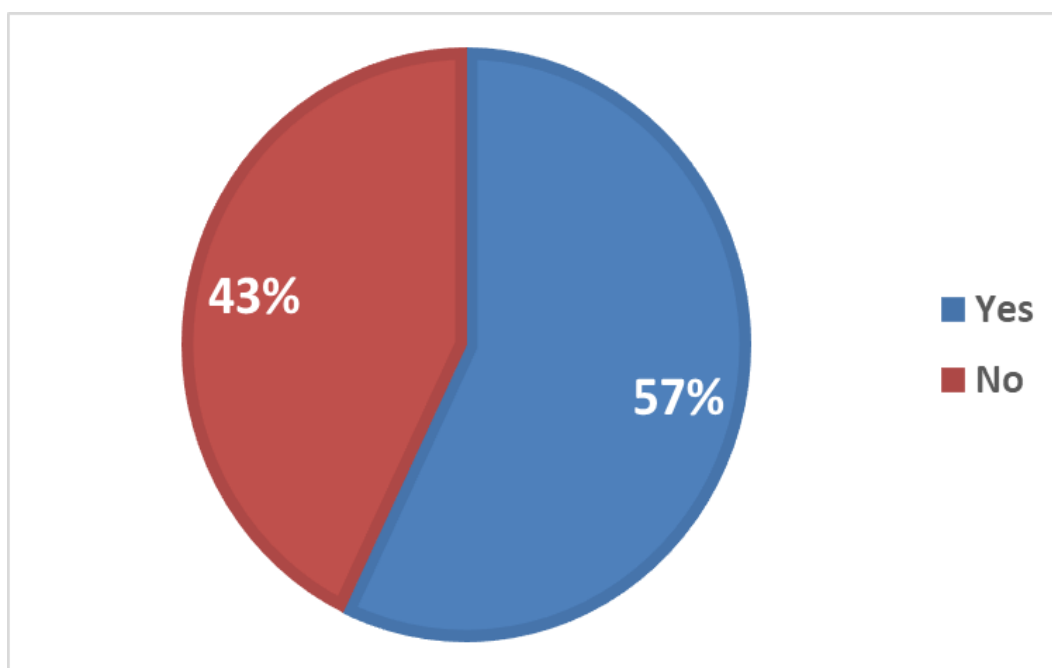


Figure 4.8: Stigmatization being experienced by students in school

4.6.1 Students personal feelings about menstruation

Menstruation is a natural biological process that affects many students, yet personal feelings about it vary. Many emotions and opinions about menstruation were revealed during the focus group discussion with students, shedding light on their diverse experiences and perspectives.

During the discussions, a common sentiment emerged: the prevalence of embarrassment among students regarding menstruation. Many students expressed feeling self-conscious and uncomfortable about discussing or dealing with their periods in public settings. One student shared, "I always feel embarrassed when I have to ask someone for a pad. It is like this taboo topic no one wants to discuss." This sentiment was echoed by several other students who admitted to feeling awkward and ashamed about menstruation.

On the other hand, some students expressed a more neutral or positive attitude towards menstruation. One student mentioned, "I do not feel embarrassed about it. It is just a natural part of being a woman." Another student shared, "I see it as something normal and not something to be ashamed of." These responses highlight a more accepting and matter-of-fact approach to menstruation, indicating that not all students feel embarrassed or stigmatized by it.

An analysis of the data revealed that 52% of students reported feeling embarrassed about menstruation, while 48% did not feel embarrassed (Figure 4.9). This close split indicates that while a majority of students may experience some level of embarrassment or discomfort around menstruation, a significant portion do not share these feelings. It also suggests that there is a range of attitudes and emotions towards menstruation among students, with some feeling more at ease and accepting of this natural process.

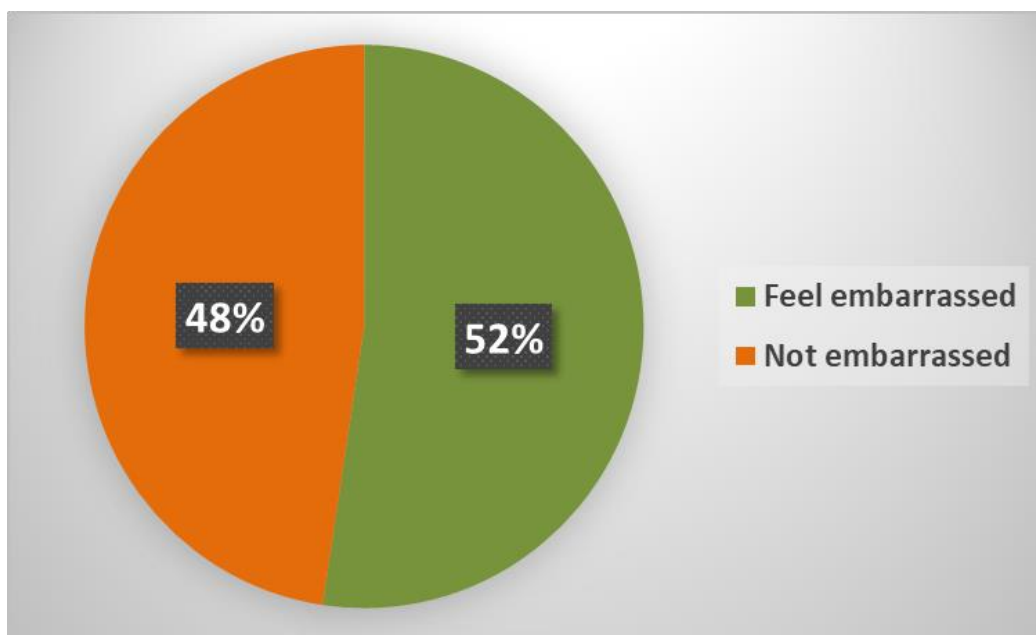


Figure 4.9: Students Feelings about Menstruation

4.6.2 Effect of peer influence on the perception of menstruation

In this article (Chothe et al., 2014), the author stated that peer influence significantly shapes students' perceptions of menstruation. The data analysis (Figure 4.10) reveals that 59% of students reported experiencing both negative and positive influences from their peers regarding menstruation. This suggests that peer interactions have a mixed impact on how students view this natural process. Positive peer influence, accounting for 12% of responses, involves open discussions, normalization of menstruation, and supportive attitudes, leading to a more

accepting and comfortable outlook. On the other hand, negative peer influence, reported by 29% of students, involves stigmatization, embarrassment, or teasing, contributing to feelings of shame and discomfort surrounding menstruation. The combination of positive and negative influences highlights the complexity of peer dynamics in shaping students' perceptions of menstruation. Schools play a crucial role in promoting positive peer interactions through education, awareness campaigns, and creating a safe space for open discussions, ultimately fostering a supportive environment where students feel empowered and accepted during their menstrual period.

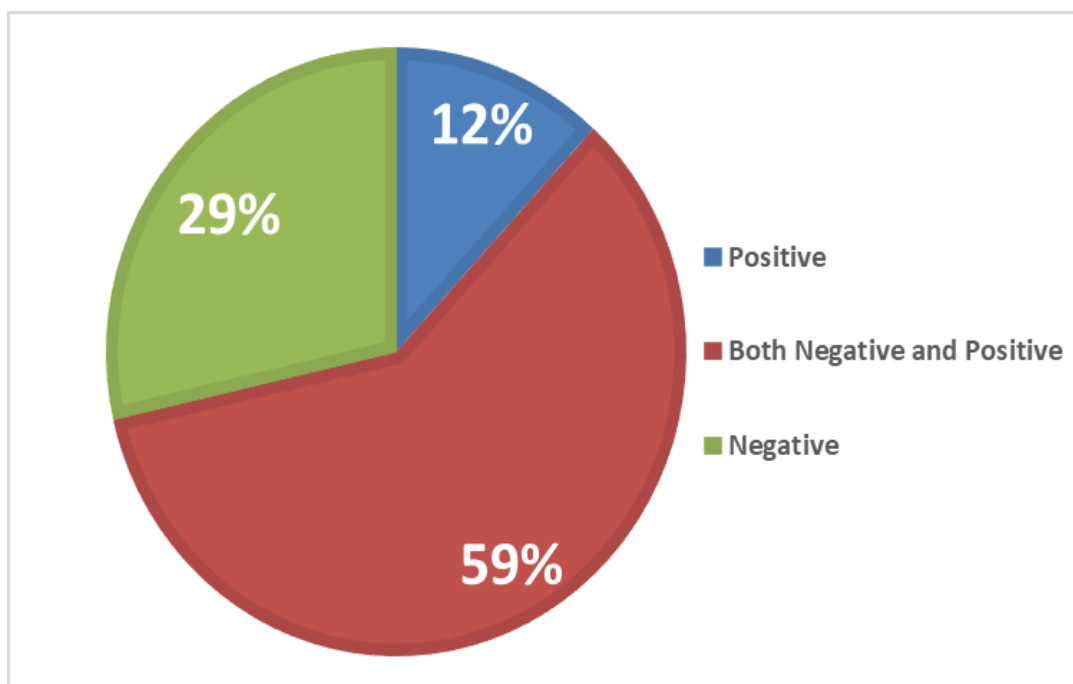


Figure 4.10: Peer perception of menstruation

4.7 Impact on attendance and academic performance

4.7.1 Attendance

Although many female students experience menstruation naturally, the stigma associated with it and the absence of appropriate facilities for managing menstrual hygiene in schools continue to have an adverse effect on students' academic performance, especially when students miss class while they are menstruating (Sihag 2022). This issue is prevalent in both public and private schools, where the absence of proper WASH facilities and societal attitudes contribute to the challenges faced by menstruating students.

The study's analysis (Figure 4.11) revealed that 64.3% of students miss school due to menstruation, and 35.7% do not miss school during menstruation. Students also face challenges such as pain, fatigue, or distraction, which impact their attendance and academic performance to some extent. This sheds light on menstruation's significant impact on attendance and academic performance.

During the discussions with female students from the four schools, many expressed their difficulties when they are menstruating. Maryan George, a 16-year-old student from the 11th-grade class of the William VS Tubman High School, shared, "I often miss school during my period because the toilets are dirty, there is no water for washing, and I do not have access to sanitary pads." This sentiment was echoed by several other students who highlighted the lack of privacy, hygiene, and menstrual hygiene products as significant barriers to attending school regularly during their periods.

In private schools, where WASH facilities are better maintained, the issue of missing school due to menstruation is still prevalent. Geraldine Johnson, a 10th-grade Joseph Jenkins Roberts United Methodist School student, shared, "Even though we have better toilets and access to sanitary pads, I still feel self-conscious and anxious during my period. Sometimes, I skip school because I do not want anyone to know." This fear of stigma and embarrassment leads to absenteeism among female students.

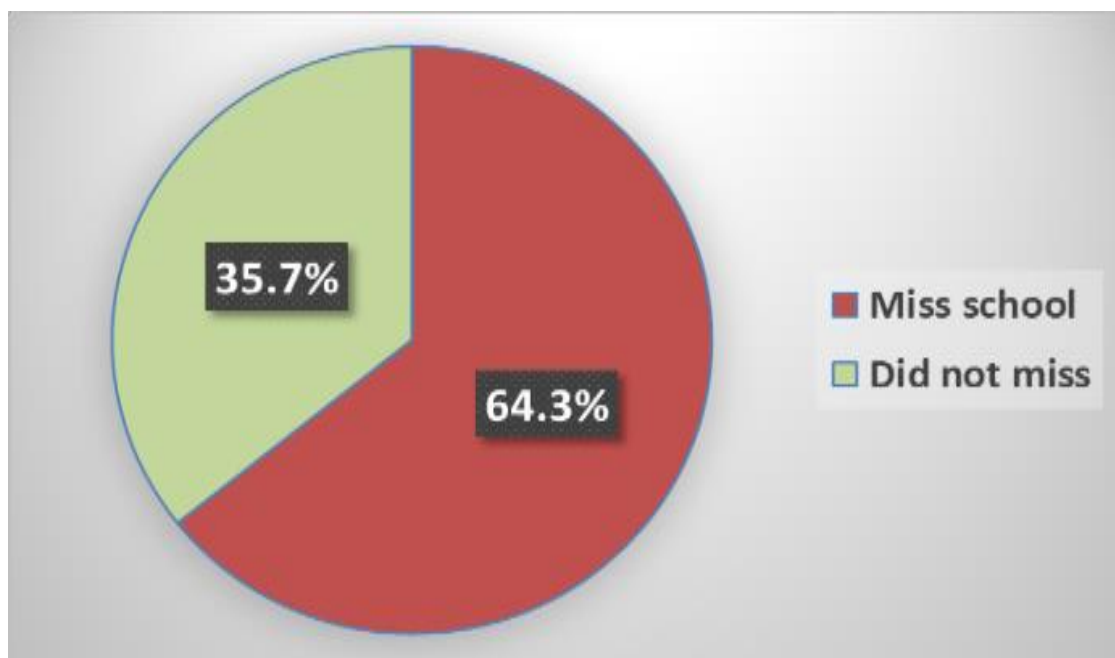


Figure 4.11: Percentages of impact on attendance

4.7.2 Academic Performance

Menstruation can have a detrimental effect on academic performance, according to Miss. Ducan, a John G. Mills High School nurse, said, "Menstruation causes physical discomfort, pain, and fatigue, which hinder students' ability to focus, concentrate, and fully engage in academics. During their menstrual cycles, students often experience distractions, irritability, and reduced motivation, which result in lower productivity and academic involvement. These factors lead to decreased grades, incomplete assignments, and a general decline in academic performance. A twelfth-grade student narrated When I am menstruating, I can feel stomach pain; if that happens, I will not be able to concentrate in class.

Providing a secure and sanitary environment for students to address their menstrual requirements helps alleviate stress, discomfort, and embarrassment, enabling them to concentrate on their academic pursuits without interruptions.

Teachers also acknowledged the impact of menstruation on students' academic performance. Mrs. Johnson, a GW Gibson High School teacher, noted, "Many of my students miss classes when they are on their period because they feel uncomfortable and embarrassed. This affects their learning and contributes to their falling behind in their studies."

According to Mr. Sampson, the Biology Instructor at the Joseph Jenkins Roberts United Methodist School, female students who are unable to attend school regularly due to their periods experience feelings of isolation, low self-esteem, and a sense of being left behind in their studies. This can have long-term implications for their educational outcomes and future opportunities.

In the study, all 420 participants answered positively to the questions in the table below. To address this during menstruation, improving WASH facilities in schools, providing access to menstrual hygiene products, and promoting menstrual hygiene education are essential. Creating a supportive and inclusive environment where female students feel comfortable and empowered to manage their periods can help reduce stigma, increase attendance rates, and ultimately enhance academic performance for all students in Liberia.

Table 4.5: Academic performance of students during menstruation

| Question | Yes/No |
|--|--------|
| Do you think menstruation negatively affects your academic performance? | Yes |
| Can access to a clean and private facility improve your feelings and academic performance? | Yes |

4.8 Student Proposed Improvements

Students in both public and private schools in Liberia are keenly aware of the challenges they face when managing their periods while at school. Many female students have proposed various improvements that they believe would significantly improve their ability to attend school regularly and focus on their studies without the hindrance of menstruation-related issues. These proposed improvements span different areas, including WASH facilities, access to menstrual hygiene products, and education (Figure 4.12).

One common suggestion among students is the need for adequate access to water. In public and private schools, students have highlighted the importance of having clean and well-equipped toilets that provide privacy, running water for washing, and proper disposal facilities for sanitary pads. Elizabeth Jackson, a student, emphasized the need for more hygienic toilets, stating, "Having clean and private toilets would make a big difference for us girls. It would help us feel more comfortable and confident during our periods."

In public schools, where WASH facilities are often inadequate, students have proposed that the government invest more resources in improving sanitation infrastructure. Monica Davies, the 12th-grade class president of the William VS Tubman High School, suggested, "The government should build more toilets with running water, upgrade the existing ones, and provide hand washing stations. This would help us stay clean and healthy during our periods." Availability and Accessibility of menstrual hygiene products is another critical concern for students in Liberia. Many female students have expressed the need for schools to provide accessible or affordable sanitary pads to ensure they can manage their periods effectively. Jane Gregory, a John G. Mills High School student, stated, "The availability of sanitary pads at school would be a huge relief for us. It would save us from the stress of trying to find or afford pads every month."

Students have also called for a WASH in Schools Policy, which will increase menstrual hygiene education in schools to raise awareness about menstruation and dispel myths and taboos surrounding periods. They believe that menstrual hygiene education in the school's curriculum would help both male and female students understand and support each other during this natural biological process. Jerry Brooks, a male student from the 11th-grade class of the Joseph Jenkins Roberts United Methodist School, shared, "I think it is important for boys to learn about menstruation too so that we can be more supportive of our female classmates."

In addition to these specific improvements, students have emphasized the need for a supportive and inclusive school environment where menstruating students feel comfortable and empowered. They believe that creating a culture of openness and understanding around menstruation would help reduce stigma and encourage female students to attend school regularly during their periods.

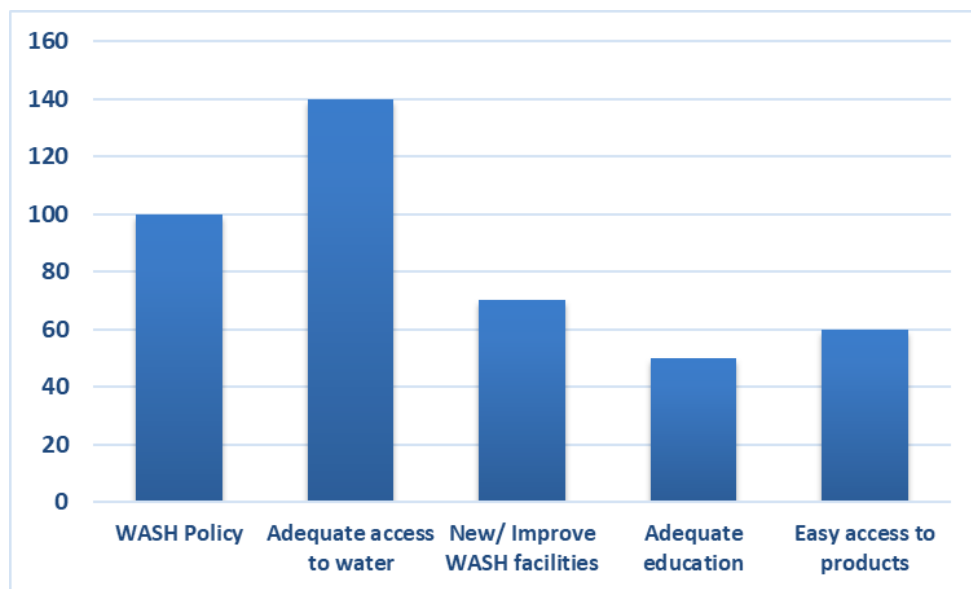


Figure 4.12: Student proposed improvements

CHAPTER 5: CONCLUSION AND RECOMMENDATIONS

5.1 Conclusion

Evaluating the condition of Water, Sanitation, and Hygiene (WASH) facilities in schools is a crucial measure in tackling the menstrual challenges encountered by female students in Montserrado. Having access to clean and private facilities for managing menstrual hygiene is crucial for safeguarding girls' health, dignity, and overall well-being during their menstrual cycles. Through comprehensive evaluations of WASH facilities in educational institutions, policymakers, educators, and stakeholders can pinpoint deficiencies and prioritize enhancements to establish a conducive setting for female students.

Tackling challenges related to menstruation necessitates a comprehensive approach that extends beyond mere enhancements to infrastructure. Promoting positive menstrual health practices among students involves implementing comprehensive education and awareness-raising initiatives for hygiene management. By incorporating menstrual health education into the school curriculum and fostering open and supportive discussions, schools can empower young girls to assert agency over their bodies and challenge detrimental stigmas and stereotypes associated with menstruation.

Engaging students in addressing menstruation challenges is essential to promote a sense of ownership and empowerment. By actively engaging with the perspectives and insights of female students, educational institutions can gain a deeper understanding of their unique requirements and preferences. This knowledge can then be used to foster a collaborative approach to developing practical and lasting solutions that prioritize the overall well-being of these students. Establishing a secure and all-encompassing environment for discourse in educational institutions enables students to express their worries, seek assistance from their fellow students and educators, and champion their entitlements.

The study delves into various case studies from countries such as Kenya, India, and Ethiopia to explore the solutions implemented to address issues similar to the lack of Water, Sanitation, and Hygiene (WASH) facilities and water access that Liberia is currently facing. These case studies provide valuable insights into practical strategies and interventions that successfully improve menstrual hygiene management and overall WASH conditions in schools.

This study is the first of its kind in Liberia, shedding light on the lack of proper facilities and resources in schools in Montserrado County. The majority of schools in the region are not well-equipped, with only some private schools having the necessary resources. Additionally, there is a notable absence of formal menstrual education in schools, leaving many students without essential knowledge and support. The lack of gender-specific toilets further exacerbates the challenges faced by students, particularly girls, in accessing safe and hygienic facilities. These findings highlight the urgent need for improved infrastructure and educational resources in schools across Montserrado County to ensure a conducive learning environment for all students.

Through collaboration, schools can establish an environment that fosters support and inclusivity for all students. This will guarantee that every girl has the necessary resources, information, and assistance to manage her menstrual cycle confidently and respectfully. By working together and placing a solid emphasis on MHM, we have the potential to build a future that is fair and empowering for young girls in Liberia.

5.2 Recommendations

In Liberia, menstrual hygiene management remains a significant challenge for many girls, particularly in schools where inadequate facilities and limited access to menstrual hygiene products hinder their ability to manage their periods with dignity and comfort.

Based on the review of the study, the following recommendations are made:

Comprehensive Menstrual Hygiene Education: One key recommendation for improving menstrual hygiene management in Liberian schools is to prioritize comprehensive menstrual hygiene education. This should include age-appropriate information on menstrual health, hygiene practices, and the importance of proper WASH facilities. By integrating MHM into the school curriculum and conducting regular awareness campaigns for students, teachers, and parents, Liberia can help break the stigma surrounding menstruation and empower girls to manage their periods effectively.

Infrastructure Upgrades: Another crucial recommendation is to invest in upgrading and maintaining WASH facilities in schools. This includes constructing separate, gender-sensitive toilets with adequate water supply and disposal systems. By ensuring that girls have access to

clean and private toilets equipped with sanitary bins and handwashing stations, Liberia can create a more hygienic and dignified environment for managing menstruation. Regular maintenance and hygiene protocols should also be established to keep the facilities in good condition.

Access to Menstrual Hygiene Products: To further support girls in managing their periods, Liberia should prioritize providing access to affordable and sustainable menstrual hygiene products. This can be achieved through partnerships with local suppliers, NGOs, or government programs that distribute sanitary pads or menstrual cups to schools on a regular basis. Additionally, promoting reusable options and teaching girls how to make their own cloth pads can help ensure long-term access to menstrual hygiene products, especially in resource-constrained settings.

Community Engagement and Policy Advocacy: Lastly, it is essential to engage local communities, school authorities, and policymakers in discussions on menstrual hygiene management and advocate for gender-sensitive policies that prioritize WASH facilities and water access in schools. By fostering partnerships with key stakeholders and raising awareness about the importance of menstrual health, Liberia can drive sustainable change at the grassroots level. Advocating for budget allocations for WASH infrastructure improvements and promoting gender equality in education policies can help institutionalize support for menstrual hygiene management in schools across the country.

REFERENCE

- Abor, P. A. (2022). Menstrual hygiene management in public high schools in Ghana. *African Health Sciences*, pp. 22, 88–91. <https://doi.org/10.4314/ahs.v22i1.11>
- Aluma, F., & Ongom, A. (n.d.). Challenges Faced By Girl Child Aged Between 9-18 Years I n Menstrual Hygiene I n Schools . A Cross-Sectional Study Of Ogur. 1–7.
- Article, C. M. E. R. (2017). CME Review Article. *Pediatric Emergency Care*, 33(12), 792–793. <https://doi.org/10.1097/01.pec.0000526609.89886.37>
- Asumah, M. N., Abubakari, A., & Aninanya, G. A. (2022). Determinants of Menstrual Hygiene Management Practices among Schoolgirls: A Cross-Sectional Study in the Savannah Region of Ghana. *Infectious Diseases in Obstetrics and Gynecology*, 2022. <https://doi.org/10.1155/2022/7007117>
- Barkollie, O. J. (2022). Influencing Factor Analysis and Countermeasures for Improving Hygienic Management for School Girls During Menstruation Period: A Case Study of Ten (10) Schools on Bushrod Island, Monrovia Liberia. *Civil and Environmental Research*, 14(2), 41–48. <https://doi.org/10.7176/cer/14-2-03>
- Chothe, V., Khubchandani, J., Seabert, D., Asalkar, M., Rakshe, S., Firke, A., Midha, I., & Simmons, R. (2014). Students’ Perceptions and Doubts About Menstruation in Developing Countries: A Case Study From India. *Health Promotion Practice*, 15(3), 319–326. <https://doi.org/10.1177/1524839914525175>
- Cotropia, C. A. (2019). Menstruation Management in United States Schools and Implications for Attendance, Academic Performance, and Health. *Women’s Reproductive Health*, 6(4), 289–305. <https://doi.org/10.1080/23293691.2019.1653575>
- Davis, J., Macintyre, A., Odagiri, M., Suriastini, W., Cordova, A., Huggett, C., Agius, P. A., Faiqoh, F., Budiyan, A. E., Quillet, C., Cronin, A. A., Diah, N. M., Triwahyunto, A., Luchters, S., & Kennedy, E. (2018). Menstrual hygiene management and school

absenteeism among adolescent students in Indonesia: evidence from a cross-sectional school-based survey. *Tropical Medicine and International Health*, 23(12), 1350–1363. <https://doi.org/10.1111/tmi.13159>

Disability-Inclusive and Accessible WASH Services for Refugees in Jordan. (n.d.).

Ellis, A., Haver, J., Villasenor, J., Parawan, A., Venkatesh, M., Freeman, M. C., & Caruso, B. A. (2016). WASH challenges to girls' menstrual hygiene management in Metro Manila, Masbate, and South Central Mindanao, Philippines. *Waterlines*, 35(3), 306–323. <https://doi.org/10.3362/1756-3488.2016.022>

esther gerlach, alice brandt, michael koberlein. (2021). MENSTRUAL HEALTH AND MENSTRUAL HYGIENE MANAGEMENT A contribution of Sanitation for Millions to improved gender equality and safer hygiene Table of contents.

Fatajo, E. (2024). *Journal of Integrated Sciences* MENSTRUAL HYGIENE AND MANAGEMENT PRACTICES IN LOWER AND UPPER BASIC SCHOOLS WITHIN THE REGION ONE EDUCATION DIRECTORATE . THE GAMBIA. February, 154–195.

Fleming, J., & Zegwaard, K. E. (2018). Methodologies, methods and ethical considerations for conducting research in work-integrated learning. *International Journal of Work-Integrated Learning*, 19(3), 205–213.

Girmay, A. M., Weldegebriel, M. G., Mengesha, S. D., Serte, M. G., Weldetinsae, A., Alemu, Z. A., Dinssa, D. A., Wagari, B., Alemayehu, T. A., Kenea, M. A., Teklu, K. T., Gobena, W., Fikresilassie, G., Adugna, E. A., Tessema, M., & Tollera, G. (2023). Factors influencing access to basic water, sanitation, and hygiene (WASH) services in schools of Bishoftu Town, Ethiopia: a cross-sectional study. *Discover Sustainability*, 4(1). <https://doi.org/10.1007/s43621-023-00122-0>

Girod, C., Ellis, A., Andes, K. L., Freeman, M. C., & Caruso, B. A. (2017). Physical, Social, and Political Inequities Constraining Girls' Menstrual Management at Schools in Informal Settlements of Nairobi, Kenya. *Journal of Urban Health*, 94(6), 835–846. <https://doi.org/10.1007/s11524-017-0189-3>

- Hennegan, J., Shannon, A. K., Rubli, J., Schwab, K. J., & Melendez-Torres, G. J. (2019). Women's and girls' experiences of menstruation in low-and middle-income countries: A systematic review and qualitative metasynthesis. In *PLoS Medicine* (Vol. 16, Issue 5). <https://doi.org/10.1371/journal.pmed.1002803>
- Hennegan, J., Tsui, A. O., & Sommer, M. (2019). Missed Opportunities : Menstruation Matters for Not Have Woman Cannot Die from a Pregnancy She Does Family Planning. *45*, 55–59.
- House, S., Mahon, T., & Cavill, S. (n.d.). A resource for improving menstrual hygiene around the world.
- Hussain, G. (2014). Menstrual Hygiene Practices and Awareness among Adolescent Girls in Government Schools of Karachi, West. *Nurture*, *8*(1), 30–34.
- Idoko, L. O., Okafor, K. C., & Victoria, A. O. (2023). Facilities and Misconceptions Concerning Menstrual Health and Menstrual Hygiene Management among Young People in Jos, Plateau State, Nigeria. *Open Journal of Obstetrics and Gynecology*, *13*(05), 918–933. <https://doi.org/10.4236/ojog.2023.135079>
- Jaafar, H., Ismail, S. Y., & Azzeri, A. (2023). Period Poverty : A Neglected Public Health Issue. 183–188.
- Jahan, F., Nuruzzaman, M., Sultana, F., Mahfuz, M. T., Rahman, M., Akhand, F., Luby, S. P., Unicomb, L., & Winch, P. J. (2020). Piloting an acceptable and feasible menstrual hygiene products disposal system in urban and rural schools in Bangladesh. *BMC Public Health*, *20*(1), 1–14. <https://doi.org/10.1186/s12889-020-09413-x>
- Jahan, F., Shuchi, N. S., Shoab, A. K., Alam, M. U., Bashar, S. M. K., Islam, K., Jahan, H., Hasan, M., Alam, M. M., & Rahman, M. (2024). Changes in the menstrual hygiene management facilities and usage among Bangladeshi school girls and its effect on school absenteeism from 2014 to 2018. *Global Health Action*, *17*(1). <https://doi.org/10.1080/16549716.2023.2297512>
- Kanwal, D. W., Edwin, D. C. A., Ahmad, D. A., & Rafaqat, U. (2022). Creating Awareness

- about Cleanliness and Hand Hygiene among Students at Primary Level. *Journal of Management Practices, Humanities and Social Sciences*, 6(1), 40–48. <https://doi.org/10.33152/jmphss-6.1.5>
- Kaur, K., Kaur, A., Bhatia, R., & Mishra, R. (2024). Menstrual Hygiene Awareness, Challenges and Quality of Life. *BIO Web of Conferences*, 86, 1–7. <https://doi.org/10.1051/bioconf/20248601024>
- 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. <https://doi.org/10.1155/2018/1730964>
- Kowalski, R. M., & Chapple, T. (2000). The social stigma of menstruation: Fact or fiction? *Psychology of Women Quarterly*, 24(1), 74–80. <https://doi.org/10.1111/j.1471-6402.2000.tb01023.x>
- Long, J., Caruso, B. A., Lopez, D., Vancraeynest, K., Sahin, M., Andes, K. L., & Freeman, M. C. (2013). WASH in Schools Empowers Girls' Education in Rural Cochabamba, Bolivia. 1–56.
- MOE-Ethiopia. (2017). National School Water, Sanitation and Hygiene (SWASH) Implementation Guideline.
- Mohammed, S., Larsen-Reindorf, R. E., & Awal, I. (2020). Menstrual Hygiene Management and School Absenteeism among Adolescents in Ghana: Results from a School-Based Cross-Sectional Study in a Rural Community. *International Journal of Reproductive Medicine*, 2020, 1–9. <https://doi.org/10.1155/2020/6872491>
- Mohd Arifin, S. R. (2018). Ethical Considerations in Qualitative Study. *International Journal of Care Scholars*, 1(2), 30–33. <https://doi.org/10.31436/ijcs.v1i2.82>
- Mujere, N. (2016). Sampling in Research (Issue March 2016). <https://doi.org/10.4018/978-1-5225-0007-0.ch006>

- Mumtaz, Z., Sivananthajothy, P., Bhatti, A., & Sommer, M. (2019). “How can we leave the traditions of our Baab Daada” socio-cultural structures and values driving menstrual hygiene management challenges in schools in Pakistan. *Journal of Adolescence*, 76(January), 152–161. <https://doi.org/10.1016/j.adolescence.2019.07.008>
- Munro, A. K., Hunter, E. C., Hossain, S. Z., & Keep, M. (2021). A systematic review of the menstrual experiences of university students and the impacts on their education: A global perspective. *PLoS ONE*, 16(9 September). <https://doi.org/10.1371/journal.pone.0257333>
- Nanjundeswaraswamy, T. S., & Divakar, S. (2021). Determination of Sample Size and Sampling Methods in Applied Research. *Proceedings on Engineering Sciences*, 3(1), 25–32. <https://doi.org/10.24874/pes03.01.003>
- NIXON, W. C. (1953). Menstrual hygiene. *The Practitioner*, 171(1024), 458–459. https://doi.org/10.1007/978-1-4615-7128-5_5
- Olukanni, D. O. (2013). Assessment of wash program in public secondary schools in South-Western Nigeria. *ARPN Journal of Engineering and Applied Sciences*, 8(3), 222–228.
- Pu, C. J. R., Patel, P., Hornsby, G., Darmstadt, G. L., & Davis, J. (2022). conditions for sustainable water and sanitation service delivery in schools *PLoS ONE*, 17(7 July), 1–23. <https://doi.org/10.1371/journal.pone.0270847>
- Repository, I. (2003). Hygiene Education. *Education*, June.
- S., A., R., S., M., J., & P., R. (2020). Study of adolescent stage and its impacts on adolescents. *European Journal of Molecular and Clinical Medicine*, 7(6), 1369–1375. https://ejmcm.com/pdf_3680_8b703531d48c7f0cf5d1cd2a097225de.html%0Ahttp://ovidsp.ovid.com/ovidweb.cgi?T=JS&PAGE=reference&D=emed21&NEWS=N&AN=2010507799
- Sanni, K. T. (2019). The Influence of Menstruation on the Academic Achievement of Senior Secondary School Biology Students in Irewole Local Government, Osun State, Nigeria. *International Journal of Academic Pedagogical Research*, 3(4), 11–16. www.ijeais.org/ijapr

- Sihag, J. (2022). Menstrual Hygiene Management Facilities at home affect the Academic Performance of Adolescent Girls. August.
- Singh, A. (2021). Significance of Research Process in Research Work. SSRN Electronic Journal, June. <https://doi.org/10.2139/ssrn.3815032>
- Sommer, M., Caruso, B. A., Sahin, M., Calderon, T., Cavill, S., Mahon, T., & Phillips-Howard, P. A. (2016). A Time for Global Action: Addressing Girls' Menstrual Hygiene Management Needs in Schools. *PLoS Medicine*, 13(2). <https://doi.org/10.1371/journal.pmed.1001962>
- Sommer, M., Caruso, B. A., Torondel, B., Warren, E. C., Yamakoshi, B., Haver, J., Long, J., Mahon, T., Nalinponguit, E., Okwaro, N., & Phillips-Howard, P. A. (2021). Menstrual hygiene management in schools: midway progress update on the “MHM in Ten” 2014–2024 global agenda. *Health Research Policy and Systems*, 19(1), 1–14. <https://doi.org/10.1186/s12961-020-00669-8>
- Sommer, M., & Sahin, M. (2013). Advancing the global agenda for menstrual hygiene management for schoolgirls. *American Journal of Public Health*, 103(9), 1556–1559. <https://doi.org/10.2105/AJPH.2013.301374>
- Spruce, L. (2021). Hand Hygiene. *AORN Journal*, 113(3), 286–294. <https://doi.org/10.1002/aorn.13340>
- SWA. (2022). Liberia Country Overview. 1–7. https://www.sanitationandwaterforall.org/sites/default/files/2022-07/2022_Country_Overview_Liberia.pdf
- Swedish International Development Cooperation Agency. (2016). Health: Both a prerequisite and an outcome of sustainable development. 1–4. <http://www.sida.se/contentassets/2d05faf3aebc4092a0ef96439c026262/cceb317a-2662-46cf-9114-8c988b8318a1.pdf>
- Taherdoost, H. (2021). Data Collection Methods and Tools for Research; A Step-by-Step

Guide to Choose Data Collection Technique for Academic and Business Research Projects. *International Journal of Academic Research in Management (IJARM)*, 2021(1), 10–38. <https://hal.science/hal-03741847>

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

Tshomo, T., Singh Gurung, M., Shah, S., Cuesta, J. G., Maes, P., Wangdi, R., & Tobden, J. (2021). Menstrual Hygiene Management—Knowledge, Attitudes, and Practices Among Female College Students in Bhutan. *Frontiers in Reproductive Health*, 3(August). <https://doi.org/10.3389/frph.2021.703978>

UNICEF's Strategy for Water, S. and H. (2016-2030). (2016). Strategy for Water , Sanitation and Hygiene. Unicef, 1–75.

UNICEF India. (2014). WASH in Schools in India: Commitments and Actions.

Usman Adam, M., Kpeebe, Y., Usman Adam, B., Adams, A., & Sahabi, S. (2023). Beyond access to adequate WASH facilities: Menstrual hygiene practices of high school adolescent girls. *Journal of Adolescence*, 95(3), 617–626. <https://doi.org/10.1002/jad.12136>

WHO. (2018). WHO global water, sanitation and hygiene. 52. https://www.who.int/water_sanitation_health/publications/global-water-sanitation-and-hygiene-annual-report-2018/en/

Willettts, J., Pedi, D., Carrard, N., Powel, B., & De Lacy, I. (2008). NGO Partnerships and Capacity Development in the Water Sanitation and Hygiene Sector. October, 1–111.

Yaliwal, R. G., Biradar, A. M., Kori, S. S., Mudanur, S. R., Pujeri, S. U., & Shannawaz, M. (2020). Menstrual Morbidities, Menstrual Hygiene, Cultural Practices during Menstruation, and WASH Practices at Schools in Adolescent Girls of North Karnataka, India: A Cross-Sectional Prospective Study. *Obstetrics and Gynecology International*, 2020. <https://doi.org/10.1155/2020/6238193>

APPENDICES

Appendix 1: Questionnaire for Data Collection

Topic: Improving WASH facilities in Schools to Combat the Issue of Stigmatized Menstruating Students in Montserrado County, Liberia.

Section 1: General Information

School Name:

Address of the School:

Location of the School:

Date of Interview:

Respondent Consent: Yes/No

District:

Class/Position:

Sex: Male/Female

Age:

Section 2: Knowledge and Awareness

1. Have you received/listened to any menstrual hygiene education at school? Yes/No
2. How would you rate your knowledge about menstrual hygiene on a scale of 1 to 5 (1 being low, 5 being high)?
3. What sources of information about menstrual hygiene do you have access to at school?

- ❖ Class lecture
- ❖ Health Club
- ❖ Library
- ❖ Media
- ❖ Social Media

Section 3: Access to Menstrual Hygiene Products

4. Are menstrual hygiene products available in the school? Yes/No

5. If yes, what types of menstrual hygiene products are available?

- ❖ Sanitary pads
- ❖ Tampons
- ❖ Menstrual cups

6. How easily can you access these products when needed?

- ❖ Very fast
- ❖ Very easily
- ❖ Somewhat easily
- ❖ Very slow
- ❖ Takes longer time
- ❖ Not at all

Section 4: Facilities and Environment

7. How often do you think WASH facilities in your school are cleaned and maintained?

- ❖ Daily
- ❖ Two times a Week
- ❖ Weekly
- ❖ One time a month
- ❖ Two times a month
- ❖ Not at all

8. How would you describe the cleanliness of the school WASH facility?

- ❖ Very Clean
- ❖ Good Fair
- ❖ Poor
- ❖ Not Clean

9. Are there separate toilets or facilities for girls and boys? Yes/No

10. Do you think there should be separate WASH facilities for menstruating students?

Yes/No

11. Are there facilities for washing hands with soap and water near the toilets? Yes/No

Section 5: Comfort and Privacy

12. How comfortable do you feel managing your menstruation at school on a scale of 1 to 5 (1 being very uncomfortable, 5 being very comfortable)
13. Do you feel you have enough privacy in the school washrooms? Yes/No

Section 6: Stigma and Peer Influence

14. Have you ever witnessed or experienced stigmatization of menstruating students in your school? Yes/No
15. Have you ever felt stigmatized or embarrassed about your menstruation at school? Yes/No
16. How do you think peer influence affects the way menstruation is perceived at school?

Section 7: Impact on Attendance and Academic performance

17. Have you ever had to miss school due to lack of access to menstrual products or appropriate WASH facilities? Yes/No
18. How do you think menstruation affects girls' attendance and academic performance in school?

Section 8: Suggestions for Improvement

19. Do you think having access to clean and private WASH facilities would help combat this issue? Yes/No
20. What improvements do you think could be made to existing WASH facilities in your school to better accommodate menstruating students?
 - ❖ Providing access to clean and safe water
 - ❖ Provide Private and Well-Equipped Restrooms
 - ❖ Improved Waste Disposal Facilities
 - ❖ Offering menstrual hygiene products
21. What improvements would you suggest regarding menstrual hygiene management at school?
22. How can the school better support and address the WASH needs of students?
23. Would you be willing to advocate for improved WASH facilities in your school to combat stigmatization of menstruating students? Yes/No
24. Do you think education and awareness campaigns on menstrual hygiene management could also help combat stigmatization of menstruating students? Yes/No
25. What other suggestions do you have for addressing this issue in your schools?

Appendix 2: Letter of Permission from the Monrovia Consolidated School System (MCSS)



MONROVIA CONSOLIDATED SCHOOL SYSTEM

12th Street, Sinkor – P.O. Box 1545
Monrovia, Liberia



Office of the Asst. Superintendent

January 17, 2024

Mr. Z. Abraham Gardour
Principal
W.V.S. Tubman High School
Monrovia Consolidated School System
12th Street, Sinkor
Monrovia, Liberia

Dear Mr. Gardour:

Ref: Permission to allow Miss Vivian Wreh conduct her WASH Research at Your School

I am pleased to introduce Miss Vivian Wreh, a Liberian student who is pursuing her master's degree in an overseas university. She is writing her thesis in the area of WASH and would like to work with some of your female students to collect data for the thesis.

Please afford her the opportunity to do so, while ensuring that she has all the needed assistance to carry out her research.

Thanks for your kind cooperation in the above regards.


Samuel M. Johnson
Assistant Superintendent



Website: www.mcsliberia.org - Email: smjohnson@mcsliberia.org / smawoloj@gmail.com
- Tel.: +231 776 360 868 / +231 886 553 752

Appendix 3: Internship Application

Vivian F. Wreh
Gbenbar Town, Paynesville
visco599@gmail.com
November 22, 2023

National Water, Sanitation, and Hygiene Commission
Office of the CEO
Ambassador Bobby Whitfield
18th Street, Sinkor
Monrovia, Liberia

Dear Sir

I'm interested in working as an intern in the Sanitation Department at the WASH Commission. I am currently pursuing a Master of Science degree in Water Policy at the Pan African University of Water Energy Sciences. I possess a strong drive and deep enthusiasm for pursuing a career in the water, sanitation, and hygiene sector, as evidenced by my choice of thesis topic (Improving WASH facilities in Public Schools to Combat the Issue of Stigmatized Menstruating Students in Liberia).

I am deeply impressed by the efforts of the WASH Commission in guaranteeing universal access to uncontaminated water, adequate sanitation facilities, and comprehensive hygiene education for all communities nationwide. I would be honored to contribute my skills and knowledge to this noble cause.

Throughout my academic journey, I have acquired theoretical expertise in different facets of WASH through my coursework. Nevertheless, I think hands-on experience is indispensable for comprehensively comprehending the industry. An internship at the WASH Commission will allow me to apply my theoretical expertise and glean insights from seasoned professionals.

I am sure that my proficiency in the field will be a valuable advantage to your institution. I possess an exceptional aptitude for learning, excel in collaborative environments, and demonstrate outstanding abilities in communication and analysis.

I can start the internship on December 4th and will appreciate your consideration of my application.

Yours faithfully,

Vivian F. Wreh

Appendix 4: Acceptance Letter

18th Street Sinkor
Monrovia, Liberia
Tel: (+231) 778464659
email: bobbywhitfield@live.com.au



Office of the
Commissioner / Chairman & CEO
National Water Sanitation
and Hygiene Commission

Monday, December 18, 2023

Ms. Vivian R. Wreh
Monrovia-Liberia

Ref: Letter of Acknowledgement & Consideration for Intern at the Commission:

Dear Ms. Wreh,

I present heartfelt compliments of best wishes on behalf of the above mentioned institution and kindly acknowledged your humble request in pursuit of doing your intern at the Commission which will give you a broader concept of the WASH sector which your request is considered. As a young Liberian studying in such unique field which we continued to encourage others to take advantage of, we take pride in your current enrollment as a student at the **Pan African University for Water, Energy Science and Climate Change**, located in Algeria.

As was discussed with you, the Commission doesn't provide compensation for interns during such academic or research period and all employees are placed on Government's payroll through the Civil Service Agency. Kindly note that due to your ability to have deeper knowledge, mainly in the technical area of the WASH sector, we will assign you rotational with the different units under the supervision of the **Director of Planning Programs and Technical Services** within the Commission and you can schedule yourself not to make it burden for you financially (Transportation).

As the Principal government's institution for Water, Sanitation and Hygiene Services, we remain committed to share knowledge and basic information which can be seen as improvement of the sector in a relatively short time and the hiccups/constraints as well in the sector, which can also help your study visit. I am pleased to remind you that due to the expanded time you have in country & requested for, realizing the current status of the governance process of a transition, the Commission will grant you at least Two (2) months for such process.

Welcome and wish you a productive stay within the Commission.

With High Esteem, I Remain.

A handwritten signature in black ink, appearing to read 'Bobby Whitfield'.

Amb. Bobby Whitfield
Chief Executive Officer/ Chairman

Mandate: To promote and regulate the development, management of water, sanitation and hygiene services and serve as the principal government entity on water, sanitation and hygiene throughout the Republic of Liberia



Appendix 5: Letter of Appreciation

Chief Executive Officer
Hon. Bobby Whitfield
National Water, Sanitation and Hygiene Commission
18th Street Sinkor, Monrovia, Liberia
March 24th, 2024

Dear Sir,

I am pleased to present my compliments and wish to extend my warmest gratitude to the senior management and staff for the opportunity to complete my two-month internship with the WASH Commission. It has been an incredibly enriching experience, and I am immensely grateful for the support and guidance I received during the period with your esteemed organization.

During my stay, I was warmly welcomed into a team of dedicated professionals deeply committed to promoting water, sanitation, and hygiene initiatives. My experience gained during my internship has been invaluable, providing me with a comprehensive understanding of the complexities and challenges faced in the field of WASH, especially in Liberia.

Reflecting on my internship experience, I am filled with accomplishment and gratitude. The insights gained and lessons learned will serve as a solid foundation for my future endeavors in the field of WASH. I am inspired by the commission's impactful work and remain committed to advocating for sustainable solutions to address water and sanitation challenges in Liberia.

Once again, thank you for providing me with this invaluable opportunity, and I look forward to staying connected with the commission in the future. Please convey my sincere appreciation to everyone who made my internship experience memorable and rewarding.

With warm regards,

Vivian F. Wreh
Intern

