



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

Master Dissertation

Submitted in partial fulfillment of the requirements for the

Master of Science degree in

WATER POLICY

Presented By:

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Reg. No: PAUWES/2023/MWP10

**Assessment of Water, Sanitation, and Hygiene (WASH) Standards in
Healthcare Facilities in Bawku West District, Ghana**

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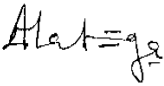
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DEDICATION

I dedicate this thesis to my family for their support and encouragement and the resilient communities striving for better water, sanitation, and hygiene standards in their healthcare facilities.

CERTIFICATION

This thesis has been submitted for examination with my approval as the university supervisor

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DECLARATION

I, Rahama Alhassan, hereby declare that this thesis, entitled “Assessment of Water, Sanitation, and Hygiene (WASH) Standards in Healthcare Facilities in Bawku West District, Ghana,” is my original work and has not been submitted for a degree or diploma at any other university or institution.

I affirm that all sources used in this research have been duly acknowledged through proper citation and referencing, and any assistance received in conducting this study has been clearly stated.

I take full responsibility for any errors or omissions in this thesis.

Rahama Alhassan



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BIOGRAPHY

I, Alhassan Rahama, was born in Wa, located in the Upper West Region of Ghana. I attended T.I. Ahmadiyya Senior High for my secondary education before pursuing higher education at the University for Development Studies (UDS), Ghana, where I earned a Bachelor of Arts Degree in Development Studies and a Diploma in Community Development.

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ACKNOWLEDGEMENT

First, my deepest gratitude goes to the Almighty God for granting me the strength, wisdom, knowledge, and understanding to successfully complete this work

I would like to extend my sincere gratitude to the African Union for the scholarship opportunity to undertake my Master of Science Degree in Water Policy at the Pan African University Institute of Water and Energy Sciences (PAUWES), Algeria.

I am deeply grateful to my supervisor, Professor Kennedy A. Alatinga, for his invaluable guidance, support, and encouragement throughout this research. My sincere appreciation also goes to the Director of the District Health Directorate for his approval and assistance in sharing my questionnaires and encouraging health workers to respond, as well as to the officers from the District Health Directorate (DHD) for their support.

I extend my heartfelt thanks to the health workers within the healthcare facilities and the community members who participated in this study for their cooperation and valuable insights.

My appreciation also goes to my brothers, Abdul Rashid Marzouk and Mubarak Ateeque Dagadaw, and my Uncle Umar Farouk for their unwavering support and help. I sincerely thank my friend Andrew Batong for his guidance and support, and my friends and classmates, Adolphe Okombawa Sodjahin, Morris Mohindo and Alinafe Kayinbo for their support and for journeying through this academic path with me.

LIST OF ABBREVIATIONS AND ACRONYMS

CHPS	Community-Based Health Planning Services
HCAIs:	Healthcare-Associated Infections
HFCs:	Healthcare Facilities
IPC:	Infection Prevention and Control
JMP:	Joint Monitoring Program
LDCs :	Least Least-developed countries
LMICs:	Low- and Middle-Income Countries
SARA :	Service Availability and Readiness Assessment
SDG:	Sustainable Development Goal
SDI:	Service Delivery Indicator
SPA:	Service Provision Assessment
TCs :	Treatment Centers
UN:	United Nations
UHC:	Universal Health Coverage
UNICEF:	United Nations Children`s Fund
WASH:	Water, Sanitation and Hygiene
WHO:	World Health Organisation

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ABSTRACT

This study assessed the Water, Sanitation, and Hygiene (WASH) standards in healthcare facilities within the Bawku West District of Ghana. A mixed-methods approach was employed, involving 49 healthcare facilities and 175 health workers. The quantitative phase utilized a two-stage sampling procedure, stratified and simple random sampling to select health facilities and health workers. For the qualitative phase, seven key informants were purposively selected based on their relevance to the study objectives. Quantitative data were collected using semi-structured questionnaires and analyzed using descriptive statistics in SPSS version 27. Qualitative data were gathered through key informant interviews and analyzed thematically. Findings revealed that 75.5% of the healthcare facilities had access to basic water services, while 16.3 % lacked water services entirely. Additionally, 74.9% had basic sanitation services, whereas 25.1% had none. Regarding hygiene, 84% had access to basic hand hygiene services, while 9.1% lacked any hand hygiene services. Furthermore, 22.3% of facilities lacked proper waste management systems, and 28% had no structured environmental cleaning practices. Key challenges identified included the absence of dedicated water sources, inadequate toilet facilities, non-functional handwashing stations, limited availability of soap and sanitizers, insufficient hygiene training for staff, and poor waste disposal systems. Addressing these issues is crucial for enhancing the quality of healthcare delivery in the district. Consequently, the study recommends the following measures to improve WASH standards in healthcare facilities: improving WASH infrastructure; providing reliable water, soap, and hand hygiene materials; training health workers regularly on hygiene and infection control; establishing structured waste management systems; and enhancing community participation in WASH maintenance. These actions are vital to strengthening infection prevention and improving the quality of healthcare delivery in the district.

Keywords: *WASH, healthcare facilities, water and sanitation, hygiene practices, infection prevention and control, waste management, capacity building*

CHAPTER ONE

GENERAL INTRODUCTION

1.1 Background of the Study

Adequate water, sanitation, and hygiene (WASH) services alongside effective healthcare waste management are pivotal components of infection prevention and control (IPC) protocols, crucial for upholding patient safety and the quality of care (WHO, 2015). Ensuring the provision of WASH in healthcare facilities not only helps prevent nosocomial infections among patients, relatives, and staff but also upholds the dignity of vulnerable populations, including pregnant women and differently-abled individuals (Shrivastava et al., 2015). The significance of WASH in healthcare facilities is gaining widespread recognition and is implicitly reflected in the 2030 Agenda for Sustainable Development (WHO and UNICEF, 2018). WASH in healthcare facilities is crucial for achieving target 3.8, which focuses on ensuring access to quality essential healthcare services for everyone (WHO/UNICEF, 2023). Every healthcare facility should have essential, functional, and sustainable WASH services and practices to ensure the delivery of quality health services to all individuals, regardless of location (WHO, 2020).

However, inadequate WASH services in health care facilities continue to compromise the quality and safety of care, hindering progress toward universal health coverage (UHC), which aims to provide everyone with access to quality health services without financial hardship (WHO, 2020). Globally, the WHO reports one out of every four healthcare facilities lacks water access, one out of every ten lacks toilet facilities, one out of every three healthcare facilities lacks basic hand hygiene (WHO, 2022, p. 10). The issue is exacerbated in the least developed countries globally, with 50% of healthcare facilities lacking essential water services, 37% lacking basic sanitation, and 74% lacking hand hygiene at points of care (WHO, 2022, p. 10).

A lack of proper hygiene due to insufficient running water, inadequate handwashing facilities, and poorly maintained or non-functional toilets can lead to various negative outcomes within hospitals. Research indicates that inadequate WASH contributes to around 842,000 diarrheal diseases and deaths annually, with a substantial portion affecting children under five (WHO, 2014, p. 16). This highlights the critical need to improve WASH in healthcare settings to reduce health risks linked to poor sanitation and hygiene practices (Anum Doku et al., 2022).

During the Ebola epidemic in West Africa from 2014 to 2016, the absence of running water for handwashing, cleaning, and disinfection at healthcare facilities posed a significant logistical challenge in containing the spread of the virus (Cooper et al., 2016). In developing countries, healthcare-associated infections are responsible for 4% to 56% of all neonatal deaths among hospital-born babies. Notably, 75% of these deaths occur in Southeast Asia and sub-Saharan Africa (WHO, 2018, p. 27).

The essential role of WASH in ensuring the quality of care, strengthening infection prevention and control, improving maternal, child, and adolescent health, and reducing antimicrobial resistance cannot be overstated (Godfrey et al., 2019). However, the absence of WASH service infrastructure, insufficient resources, weak governance, limited collaborative efforts, inadequate capacity and awareness-building initiatives, and the lack of a robust monitoring and evaluation framework have been significant barrier to the provision of improved WASH services (Derso et al., 2023). Building the capacity of healthcare workers and enhancing health financing structures are critical steps to preventing future disease outbreaks and achieving the 2030 target of universal access to basic WASH services in all healthcare facilities (Tantum et al., 2021). Training and adequate staffing are essential for improving and maintaining WASH services in healthcare facilities, as well as implementing risk management plans (WHO, 2015).

In the Bawku West District of Ghana, many healthcare facilities face limited access to sustainable potable water and adequate sanitation infrastructure, including toilets, incinerators, and latrines (Ghana News Agency, 2024). These challenges hinder the delivery of quality healthcare services and disproportionately affect vulnerable groups, such as pregnant and lactating mothers. Highlighted during a community-duty bearer forum in Zebilla organized by WaterAid Ghana, these WASH related issues underscore the urgent need for improvements. This study aims to assess the WASH standards in healthcare facilities within the district.

1.2 Problem Statement

Ensuring health equity for everyone, especially through the realization of universal health coverage (UHC), requires the comprehensive provision of fundamental water, sanitation, and hygiene (WASH) services within all healthcare facilities. However, sustainable WASH infrastructure development continues to pose a significant challenge for numerous healthcare facilities in the Bawku West District of the Upper East Region (Ghana Broadcasting Corporation, 2024). These WASH challenges not only affect the basic needs of the facilities but also hamper the ability to maintain proper hygiene and sanitation practices, leading to increased risks of healthcare-associated infections (HCAI) (Chris Dall, 2024). The ability of healthcare facilities in this district to deliver high-quality healthcare services without obstacles connected to WASH is severely threatened by these problems. These challenges presented significant difficulties for the residents, particularly pregnant women and breastfeeding women who sought assistance at the facility for various needs (Ghana Broadcasting Corporation, 2024). The lack of proper sanitation facilities, such as toilets, incinerators, and latrines, in healthcare facilities in the district further exacerbates the WASH challenges. The absence of toilets poses difficulties for both healthcare workers and patients, compromising their health and dignity. The WASH-related challenges in healthcare facilities hinder the provision of quality health services (Ghana Broadcasting Corporation, 2024). Additionally, the lack of proper waste management systems in healthcare facilities further compounds the problem, increasing the risk of infections and environmental pollution. The lack of water supply and sanitation facilities affects the ability to maintain cleanliness and hygiene standards, increasing the risk of healthcare-associated infections (Chris Dall, 2024). This, in turn, compromises patient safety and outcomes, as well as the overall effectiveness of healthcare interventions. A consistent and safe water supply is indispensable for drinking, cooking, maintaining hand hygiene, showering, bathing, or fulfilling various medical needs (WHO & UNICEF, 2019). Families and caregivers require access to water to attend to both patients and their personal needs. A healthcare facility cannot function efficiently without an adequate water supply (WHO & UNICEF, 2019). Some health facilities in communities such as Boya and Zongoire in the Bawku West District, lack access to toilet facilities and potable water for clients. This situation poses significant challenges for residents, particularly pregnant and lactating mothers seeking various services, and complicates disease prevention and control efforts for health

workers (Ghana News Agency, 2024). Consequently, there is a critical need to assess the WASH standards in healthcare facilities in the Bawku West District of Ghana. While studies have examined WASH in healthcare settings in other parts of Ghana, there remains, to the best of the author's knowledge, a lack of systematic, district-level evidence specifically for Bawku West. This study, therefore, aims to fill that gap by assessing WASH standards in healthcare facilities within the district, contributing to the broader national discourse and providing localized data that can inform targeted interventions.

1.3 Research Questions

1.3.1 General Research Question

What are the current standards of water, sanitation, and hygiene (WASH) in healthcare facilities in the Bawku West District?

1.3.2 Specific Research Questions

The specific research questions are:

1. What is the current state of WASH standards in healthcare facilities in Bawku West District?
2. What are the gaps and areas of improvement of WASH standards in healthcare facilities in the Bawku West District?
3. What are the key challenges and opportunities for improving WASH standards in healthcare facilities in Bawku West District?

1.4 Research Objectives

1.4.1 General Research Objective

This study assessed the water, sanitation, and hygiene (WASH) standards in healthcare facilities in the Bawku West District.

1.4.2 Specific Research Objectives

Specifically, the study aims to:

1. Assess the current state of WASH standards in healthcare facilities in the Bawku West District.
2. Identify gaps and areas for improvement of WASH in healthcare facilities in Bawku West District.
3. Analyze the key challenges and opportunities for improving WASH standards in healthcare facilities in the Bawku West District.

1.5 Significance of the Study

This study is significant for several reasons. Firstly, it addresses critical gaps in knowledge and contributes to local, national, and global efforts to improve public health outcomes. HFCs play a crucial role in delivering safe and quality healthcare services. Inadequate WASH standards in these facilities can lead to HCAs, which are a significant cause of morbidity and mortality, particularly in low- and middle-income countries (LMICs) (WHO/UNICEF, 2023). By assessing the current state of WASH services, this study will provide evidence-based insights into the availability, accessibility, and functionality of WASH infrastructure in the district, highlighting areas that require immediate attention. Secondly, the findings will be instrumental in identifying gaps in WASH services and understanding the barriers and challenges faced by healthcare facilities in meeting global standards, such as those set by the WHO/UNICEF Joint Monitoring Program. This knowledge will guide policymakers, healthcare administrators, and development partners in prioritizing interventions to improve WASH services, thereby reducing the prevalence of HCAs and enhancing patient safety and healthcare quality. Additionally, the study has the potential to contribute to the achievement of national and international development goals. At the national level, it aligns with Ghana's commitment to improving healthcare services and strengthening infection prevention and control (IPC). At the global level, it supports Sustainable Development Goal (SDG) 6, which aims to ensure availability and sustainable management of water and sanitation for all, and SDG 3, which seeks to ensure healthy lives and promote well-being for all ages. Finally, the study's recommendations will serve as a valuable resource for future planning and resource allocation, providing actionable steps for improving WASH standards in healthcare facilities. It will also contribute to the body of knowledge on WASH in healthcare settings, offering insights that could be adapted and applied in similar contexts within Ghana and other LMICs. By addressing a critical aspect of healthcare delivery, this study holds the potential to significantly

impact public health outcomes and foster a healthier and more resilient healthcare system in Bawku West District.

1.6 Scope of the Study

This study focused on assessing the Water, Sanitation, and Hygiene (WASH) standards in fifty-six (56) healthcare facilities within the Bawku West District of Ghana. It assessed the availability, accessibility, and functionality of WASH infrastructure, including water supply, sanitation facilities, hygiene practices, and waste management. The study covers both public and private healthcare facilities, including medical centers, clinics, and health centers, to provide a comprehensive understanding of WASH conditions. It identifies gaps, challenges, and areas for improvement while analyzing factors such as resource constraints, policy implementation, and facility management affecting WASH services. The research is limited to the Bawku West District, making its findings context-specific but potentially applicable to similar settings in Ghana and other low- and middle-income countries (LMICs). It does not extend to household or community WASH practices. The study primarily relies on field surveys and interviews to gather data, ensuring a holistic assessment of WASH conditions in healthcare settings.

1.7 Organization of the Study

The study is organized into seven chapters. Chapter One is based on the general introduction, which comprises the background of the study, problem statement, research questions and objectives, the significance of the study, its scope, and its structural organization. Chapter two presents the literature review which gives an introduction, and theoretical underpinning, defines key concepts of the study, constructs a conceptual framework, and empirical review. Chapter three focuses on the methodology which describes the study area, type of research design, description of data sources, sampling, methods and tools of data collection, and methods of analysis. Chapter four presents the results and discussion, including socio-demographic characteristics of the respondents and the results on the specific objectives are presented. Chapter five contains the summary, conclusion, and recommendations. Chapter six presents the references which includes all publications and websites cited in the thesis. Chapter Seven presents the appendix and annex

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

This chapter provides an overview of literature germane to the subject. It includes definitions of key concepts, an examination of WASH standards in healthcare facilities, the significance of WASH in healthcare settings for achieving the SDGs, and an analysis of barriers, opportunities, and recommendations for improving WASH standards. Additionally, it explores the health implications of inadequate WASH, outlines the theoretical and conceptual frameworks, highlights gaps in the literature, and discusses contextual challenges.

2.2 Introduction to WASH Standard

2.2.1 Definition of Concepts

The provision of water, sanitation, and hygiene (WASH) services, along with effective associated practices such as healthcare waste management and environmental cleaning practices, are crucial for infection prevention and control (IPC) in healthcare facilities (HCFs) (Kruk *et al.*, 2016). WASH services enhance the resilience of healthcare systems by preventing disease outbreaks, enabling effective responses to emergencies such as natural disasters and outbreaks, and bringing emergencies under control when they occur (WHO, 2018).

Healthcare Facilities: The WHO defined the term “Health care facilities” as “all formally recognized facilities that provide health care, including primary (health posts and clinics), secondary, and tertiary (district or national hospitals), public and private (including faith-run), and temporary structures designed for emergency contexts (e.g., cholera treatment centers)”(WHO, 2014).

WASH in Healthcare Facilities: The term “WASH in health care facilities” is defined as “the provision of water, sanitation, health care waste management, hygiene and environmental cleaning infrastructure and services across all parts of a facility.” (WHO, 2014).

Water in HCFs: As defined by WHO (2015), water in HCFs refers to the “presence of a water source or water supply in or near (within 500 m) the facility for use for drinking, personal hygiene, medical activities, cleaning, laundry and cooking”.

Sanitation in HCF`s: The WHO (2015) defines sanitation as the “presence of latrines or toilets within the facility”.

Hygiene in HCF`s: refers to the “availability of handwashing stations with soap or alcohol-based hand rubs within the facility”(WHO, 2015)

Improved water sources: defined as sources that are designed and built with the capability to provide safe water. These sources include piped water, boreholes or tube wells, protected dug wells, protected springs, rainwater, as well as packaged or delivered water(WHO and UNICEF, 2018).

Improved sanitation facilities: refer to sanitation facilities that are specifically designed to safely isolate human waste from contact. These facilities include flush or pour-flush systems connected to a piped sewer system, septic tanks, or pit latrine; ventilated improved pit latrines, composting toilets, or pit latrines with slabs (WHO and UNICEF, 2018).

Functional Hygiene facilities: Hand hygiene facilities are considered functional if they provide alcohol-based hand rub or soap and water at points of care. Healthcare staff can carry dispensers between care points if using hand rub. For toilets, soap and water must be available within 5 meters, as alcohol-based rub is insufficient for removing fecal matter(WHO and UNICEF, 2018).

2.2.2 Overview of global WASH standards: Focusing on the WHO/UNICEF Joint Monitoring Program (JMP).

2.2.2.1 Core Service Levels Defined by JMP in Healthcare Facilities:

The WHO/UNICEF Joint Monitoring Program (JMP) has been providing regular updates on water, sanitation, and hygiene (WASH) since 1990. They are jointly responsible for tracking progress toward the 2030 Sustainable Development Goal (SDG) targets related to WASH. Since 2019, the JMP has also maintained a global database specifically focused on WASH services in healthcare facilities (WHO/UNICEF, 2023).

The JMP utilizes service ladders to monitor and assess progress in WASH services, focusing on access, availability, and functionality. The JMP utilizes national data to produce internationally comparable estimates for a standardized set of core indicators related to water, sanitation, hygiene, waste management, and environmental cleaning (World Health Organization, 2020).

The core indicators outline "basic" service levels for water, sanitation, hygiene, healthcare waste management, and environmental cleaning in healthcare facilities. While these indicators do not fully reflect the ideal normative service levels, they serve as a practical approximation that can be easily measured. They are designed to be applicable across all types and sizes of healthcare facilities, from primary to tertiary levels, and are generally assessed at the facility level rather than specific locations within the facility (WHO and UNICEF, 2018).

Table 1. JMP service ladders for WASH in health care facilities

	WASH in healthcare facilities service level indicators and definitions				
	Water	Sanitation	Hygiene	Waste Management	Environmental Cleaning
Higher levels of Service	To be defined at the national level				
Basic Service	Water is available from an improved source on the premises.	Improved sanitation facilities are usable, with at least one toilet dedicated for staff, at least one sex-separated toilet with menstrual hygiene facilities, and at least one toilet accessible for people with limited mobility.	Functional hand hygiene facilities (with water and soap and/or alcohol-based hand rub) are available at points of care, and within 5 meters of toilets.	Waste is safely segregated into at least three bins, and sharps and infectious waste are treated and disposed of safely.	Protocols for cleaning are available, and staff with cleaning responsibilities have all received training
Limited Service	An improved water source is available within 500 meters of the premises, but not all requirements for a basic service are met.	At least one improved sanitation facility is available, but not all requirements for a basic service are met.	Functional hand hygiene facilities are available either at points of care or toilets but not both.	There is limited separation and/or treatment and disposal of sharps and infectious waste, but not all requirements for a basic service are met.	There are cleaning protocols and/or at least some staff have received training on cleaning.
No Service	Water is taken from unprotected dug wells or springs, or surface water sources; or an improved source that is more than 500 meters from the premises; or there is no water source.	Toilet facilities are unimproved (e.g. pit latrines without a slab or platform, hanging latrines, bucket latrines) or there are no toilets.	No functional hand hygiene facilities are available either at points of care or toilets	There are no separate bins for sharps or infectious waste, and sharps and/or infectious waste are not treated/disposed of.	No cleaning protocols are available and no staff have received training on cleaning.

Source: (WHO/UNICEF, 2023)

2.2.2.2 Key Indicators for Assessment:

Proportion of Healthcare Facilities with Basic Water Services in 2021 (%)

The JMP report states that 78% of healthcare facilities worldwide had basic water services, meaning they had access to water from an improved source on-site. The availability of basic water services varied by region, with coverage ranging from 52% in sub-Saharan Africa to 90% in Eastern and South-Eastern Asia. In the least developed countries (LDCs), only 53% of healthcare facilities had access to basic water services. While 88% of hospitals had basic water services, this figure dropped to 77% for smaller healthcare facilities (WHO/UNICEF, 2023).

Proportion of Healthcare Facilities with Basic Sanitation Services in 2021(%)

In sub-Saharan Africa, only 13% of healthcare facilities had basic sanitation services, which include functional, improved sanitation facilities, at least one staff-dedicated toilet, one sex-separated toilet equipped for menstrual hygiene, and at least one toilet accessible to individuals with limited mobility. In the least developed countries (LDCs), only 21% of healthcare facilities had access to basic sanitation services. However, insufficient data from countries prevented the calculation of global coverage for basic sanitation services in healthcare facilities (WHO/UNICEF, 2023).

Proportion of Healthcare Facilities with Basic Hygiene Services in 2021 (%)

Globally, 51% of healthcare facilities had basic hygiene services, with functional hand hygiene facilities available at points of care and within five meters of toilets. In the least developed countries (LDCs), only 32% of healthcare facilities had basic hygiene services. Among healthcare facilities, 49% of government-run and 51% of non-government facilities provided basic hygiene services. Globally, 68% of healthcare facilities had hand hygiene facilities at points of care, while 65% had handwashing facilities with soap and water at toilets. In sub-Saharan Africa, 73% of healthcare facilities had hand hygiene facilities at points of care, but only 37% had handwashing facilities with soap and water at toilets. Additionally, 87% of hospitals in the region had hand hygiene facilities at points of care, compared to 68% of non-hospital facilities (WHO/UNICEF, 2023).

Proportion of Healthcare Facilities with Waste Management Services in 2021(%)

In sub-Saharan Africa, 39% of health care facilities had basic health care waste management services, this means that in these facilities, waste was segregated at the points of generation, and sharps as well as infectious waste were properly treated and safely disposed of. In least developed countries (LDCs), the coverage was 34%. However, insufficient data from countries prevented the calculation of global coverage for basic waste management services in healthcare facilities (WHO/UNICEF, 2023).

2.2.3 Importance of WASH Standards in Healthcare Facilities

Enhancing WASH facilities in healthcare settings boosts health provider morale, efficiency, and patient trust, leading to increased utilization of health services and reduced service delivery costs (WHO, 2015). Water plays a crucial role in supporting the daily operational requirements of the healthcare sector, particularly concerning activities related to infection prevention and control, as well as engineering functions (Mani et al., 2021). WASH supports critical infection prevention and control (IPC) practices, such as hand hygiene and environmental cleaning, which are vital for preventing infections, including sepsis, antimicrobial resistance (AMR), and outbreaks (World Health Organization, 2020). The COVID-19 pandemic has underscored the critical role of WASH in healthcare facilities and providing healthcare workers with essential WASH resources is crucial to protecting them, their colleagues, patients, and families (World Health Organization, 2020). Systematic reviews reveal that healthcare environmental hygiene (HEH) interventions effectively reduce patient colonization and healthcare-associated infections (HCAIs), especially those caused by multidrug-resistant organisms (MDROs) (Peters et al., 2022). In low-resource settings, studies suggest that hygiene interventions, such as enhanced water supply and sanitation, are associated with reduced healthcare-associated infection (HCAI) rates, though the evidence remains limited (Watson et al., 2019). A multicenter study revealed that implementing a probiotic cleaning system significantly decreased healthcare-associated infections (HCAIs) incidence from 4.8% to 2.3%, emphasizing the potential of innovative sanitation methods (Caselli et al., 2018). Nursing-led interventions, including hand hygiene and environmental cleaning, have been associated with a 35% reduction in healthcare-associated infections (HCAIs), underscoring the critical role of structured training and adherence to infection control protocols. WASH and waste services are

crucial for maintaining the dignity and human rights of patients, their families, healthcare providers, and non-clinical staff, particularly for vulnerable groups like mothers, newborns, children, minorities, and people with disabilities (World Health Organization, 2020).

2.2.4 Importance of WASH in achieving Sustainable Development Goals (SDG 3 and SDG 6)

The 2030 Agenda for Sustainable Development, adopted by the United Nations General Assembly in 2015, provides a framework to track progress across 17 SDGs and 169 targets from 2015 to 2030. SDG 6 focuses on ensuring the sustainable management of water and sanitation for all, with targets for universal access to safe drinking water, sanitation, and hygiene by 2030 (targets 6.1 and 6.2). SDG 3 aims to ensure healthy lives and well-being for all at all ages. These targets are ambitious but interconnected and mutually reinforcing. SDG target 3.8, which addresses universal health coverage, is monitored through an index of essential health services, including the availability of basic sanitation at home. Target 3.9 aims to "substantially reduce the number of deaths and illnesses caused by unsafe water, sanitation, and hygiene." Other targets (3.1, 3.2, 3.3) focus on reducing maternal, under-five, and neonatal mortality, as well as ending epidemics, including waterborne diseases. All of these targets are directly influenced by WASH conditions in healthcare settings (WHO/UNICEF, 2023). Achieving universal health coverage (target 3.8) is only possible when everyone has access to quality healthcare services, which must include facilities equipped with basic WASH services (WHO and UNICEF, 2019). WASH improvements are linked to a 45% reduction in diarrheal mortality and a 17% decrease in all-cause childhood mortality (Sharma Waddington et al., 2023). Access to clean water and improved sanitation significantly reduces child mortality rates, particularly in South Asia, where unsafe water remains a critical public health challenge (Ly et al., 2022). Similar to a study conducted by Alum et al., (2024), enhancing water quality, sanitation, and hygiene is a crucial intervention strategy to improve children's health and well-being, particularly in combating diarrhea, and plays a significant role in achieving SDG 3. Improved water supply plays a vital role in enhancing domestic hygiene, thereby preventing diseases and community-wide sanitation initiatives are highly effective in curbing the spread of diarrheal diseases (Sharma Waddington et al., 2023). A study conducted in 59 countries revealed sanitation improvements have played a substantial role in reducing child mortality, contributing to nearly 10% of the decline observed between 1990 and 2015 (Headey & Palloni, 2019). Despite their evident benefits, WASH interventions are hindered

by underinvestment and complex implementation challenges, limiting their effectiveness in contributing to the achievement of SDG 3 (Burton et al., 2021).

2.3 WASH in Healthcare Facilities: A Global Perspective

2.3.1 The state of WASH in healthcare facilities globally, with a focus on low- and middle-income countries (LMICs).

Access to clean water, improved sanitation, and good hygiene practices are essential for preventing the spread of diseases and infection. However, significant global gaps persist in the provision of basic WASH services in healthcare facilities (World Health Organization, 2020). WASH services in HCFs are inadequate, falling significantly short of 100% coverage world (WHO, 2015). Globally, a quarter of healthcare facilities lack basic water services, leaving 712 million people without access to water when seeking care. Additionally, 10% of facilities have no sanitation services, and one in three lack proper hand hygiene facilities at points of care. Furthermore, one-third of healthcare facilities fail to safely segregate waste (World Health Organization, 2020). According to the JMP report, 1.7 billion individuals did not have access to basic water services at their healthcare facility, which included 857 million people worldwide without any water service. Additionally, 3.85 billion people lacked basic hygiene services at their healthcare facility, with 688 million individuals having no access to hygiene services (JMP, 2024). Globally, 780 million people lacked any form of WASH service at their healthcare facility (WHO/UNICEF, 2023). Access to water was the lowest in the African Region, where 42% of healthcare facilities lacked an improved water source either on-site or nearby. Conversely, access to sanitation services was the lowest in the Americas, with 43% of healthcare facilities lacking adequate sanitation (WHO and UNICEF, 2019).

These global monitoring data, while alarming, fail to capture the daily challenges healthcare providers in LMICs face due to limited water supply. Issues such as seasonal shortages, temporary disruptions, nonfunctional infrastructure, and fluctuating water quality significantly affect the consistent availability of safe water and adherence to proper IPC practices (McGriff & Denny, 2020). In LMICs, many healthcare facilities lack essential WASH services (WHO, 2015). Insufficient WASH services in HCFs are linked to higher levels of patient dissatisfaction and, in certain cases, serve as a barrier to service utilization, particularly in maternity services (Bouzid et

al., 2018). Data from 54 countries, encompassing 66,101 facilities, reveals that 38% of healthcare facilities lack access to improved water sources, 19% lack improved sanitation facilities, and 35% do not have water and soap for handwashing (WHO, 2015). The absence of WASH services hinders the provision of essential routine care, such as childbirth, and undermines efforts to prevent and control infections. Many healthcare facilities in rural areas of LMICs lack WASH services (Guo & Bartram, 2019). Findings from Kmentt et al., (2021) highlights the widespread absence of basic WASH services in healthcare facilities across LMICs, revealing that the Sustainable Development Goal targets for WASH in healthcare facilities remain unmet in the majority of these nations. Sub-Saharan Africa (SSA) experiences significant challenges, with 54% of healthcare facilities lacking access to basic water supply and 71% lacking basic sanitation services (WHO, 2020) while 681 million people did not have access to a basic waste management service at their health care facility (WHO/UNICEF, 2023). A review of 55 studies conducted across twenty-nine countries and four WHO regions reveals that numerous lower-level HCFs in low LMICs lack sufficient WASH services (Sung, 2019). A study conducted by Guo & Bartram (2019) in 14 LMICs found that, in general, 52% of the surveyed healthcare facilities utilized a basic water service, 23% had access to limited water service, and 25% lacked any water service, according to the definition provided by the WHO/UNICEF JMP. Based on findings from a study conducted in two healthcare facilities in India, it was revealed that both inpatients and their attendants expressed feelings of insecurity while using the toilets and bathrooms. Furthermore, they reported the absence of soap, unclean hospital environments due to open defecation, and challenges with menstrual hygiene management. These challenges included the lack of buckets for the disposal of sanitary items and inadequate facilities for changing, washing, and drying reusable sanitary materials (Kohler et al., 2019). The research conducted by Kmentt *et al.* (2021) in 14 LMICs found that 20% of healthcare facilities reported the presence of open defecation on their premises, with the highest prevalence observed in Mali, where 88% of facilities reported open defecation. Additionally, only 22% of facilities were observed to have functional hand hygiene stations near the sanitation facilities. Regarding waste management services, 84% of facilities across all 14 countries had no waste management service, while only 7% provided a basic service. A descriptive cross-sectional study conducted in 59 HCFs in Uganda revealed that over half (57.6%) of the facilities required new sinks, taps, or pipes but were unable to afford them. Of those in need, the majority (91.2%) cited insufficient funds as the reason, while a small percentage (7.8%) mentioned difficulty accessing

spare parts (Isunju et al., 2022). A study conducted in Ethiopia found that no healthcare facility met the basic WASH standard (Derseo *et al.*, 2022)

2.3.2 Global initiatives and commitments to improve WASH in healthcare settings

In 2018, UN Secretary-General António Guterres issued a call to action to all UN agencies regarding the deplorable state of WASH in healthcare facilities. In response, WHO member states demonstrated their commitment by unanimously adopting a resolution on WASH in healthcare facilities at the 72nd World Health Assembly in May 2019 (McGriff & Denny, 2020). The World Health Assembly Resolution 72.7 highlights a global commitment to improving WASH in healthcare facilities to enhance the quality of essential health services. 194 member states are urged to conduct WASH and infection prevention and control (IPC) assessments, establish minimum standards integrated into regulatory systems, and develop national roadmaps for implementation. Adequate budget allocation, including for operations, maintenance, and workforce training, is emphasized, alongside a focus on facilities with poor WASH conditions, particularly those providing maternal and child health services. The resolution advocates for integrating WASH into broader health programs and fostering multisectoral coordination to ensure sustainable progress (World Health Organization, 2020). International, regional, and local partners play a critical role in promoting WASH and infection prevention and control (IPC) in healthcare facilities. They are tasked with raising the profile of WASH and IPC in health strategies and advocating for flexible funding mechanisms. These partners commit to bridging resource gaps in low-resource settings by supporting WASH implementation and empowering communities to participate in decision-making and reporting to ensure equitable access to safe WASH services. Additionally, they provide technical resources and information to facilitate the proper installation and maintenance of WASH infrastructure in healthcare facilities, fostering sustainability and safety (World Health Organization, 2020). The World Health Organization (WHO) is committed to providing global leadership and technical guidance to improve WASH and IPC in healthcare facilities. Collaborating with UNICEF, WHO monitors and reports on the global status of WASH in alignment with Sustainable Development Goal 6 and integrates WASH and IPC into universal health coverage, primary healthcare, and quality care efforts. WHO also facilitates resource mobilization and the development of national business cases for WASH and IPC. In times of crisis or humanitarian emergencies, WHO supports the implementation of safe WASH and IPC measures through Health and WASH clusters. Progress on these initiatives is reported to the World Health

Assembly, with updates provided in 2021 and 2023 (World Health Organization, 2020). WHO and UNICEF, together with over 130 partners, have pledged to support countries in implementing the resolution aimed at achieving universal WASH services in all healthcare facilities. This commitment is integral to ensuring quality care and fostering collaboration with health partners to meet global WASH objectives (World Health Organization, 2020). The WHO 2019 report highlights how the COVID-19 pandemic has driven progress on WASH initiatives in various countries. In Rwanda, the government partnered with World Vision to install handwashing facilities in 49 hospitals and 250 healthcare centers. In Ethiopia, a large-scale facility assessment during the pandemic response led to the allocation of \$5 million to support IPC and WASH improvements in 74 high-demand hospitals. Additionally, WHO and UNICEF launched the ‘Hand Hygiene for All’ (HH4A) initiative in June 2020, calling for global action to ensure universal hand hygiene and prevent the spread of COVID-19 (World Health Organization, 2020).

2.3.3 The Health Implications of Inadequate WASH in Healthcare Facilities

2.3.3.1 Healthcare-Associated Infections (HCAs)

Inadequate WASH and infection prevention and control (IPC) measures significantly contribute to healthcare-associated infections (HCAs), which are a major global public health issue (WHO/UNICEF, 2023). Poor WASH conditions are closely associated with a higher prevalence of HCAs. Research shows that implementing hygiene interventions can significantly reduce the occurrence of these infections (Watson et al., 2019). Inadequate hand hygiene practices and disruptions to water supply increase the risks of infection transmission in healthcare settings (Tamene, 2021). In high-income countries, 7% of patients in acute-care hospitals acquire at least one HCAI during their stay, while in LMICs, the rate is over twice as high, affecting 15% of patients (WHO/UNICEF, 2023). As many as 30% of patients in intensive care units experience HCAs, with rates in LMICs being 2 to 20 times higher than those in high-income countries, particularly affecting newborns (WHO/UNICEF, 2023). Sepsis accounts for about 20% of global deaths, with an estimated 11 million potentially preventable deaths annually. Around 25% of hospital-treated sepsis cases are healthcare-associated, with nearly one in four resulting in death. Over half of these cases could be prevented through basic WASH services and effective infection prevention and control (IPC) measures (WHO/UNICEF, 2023).

2.3.3.2 Antimicrobial Resistance (AMR)

Insufficient WASH facilities contribute to the alarmingly rising cases of antimicrobial resistance because they facilitate the spread of pathogens in health facilities (Maina *et al.*, 2019). Poor waste disposal and non-compliance with hygiene practices are critical contributors to AMR development, with compliance rates in some facilities being as low as 35% (Maina *et al.*, 2019). Inadequate WASH in healthcare facilities not only facilitates the transmission of preventable infections and the spread of antimicrobial resistance (AMR) but also leads to increased prophylactic antibiotic use during childbirth. This excessive antibiotic use is considered a significant contributor to the rise of AMR (WHO/UNICEF, 2023).

2.3.3.3 Maternal and Child Health

Inadequate WASH in health facilities has a great impact on maternal health outcomes, increasing the risk of infections such as genital tract infections and sepsis, which contribute to postpartum deaths and complications, thereby increasing maternal and neonatal mortality rates (R *et al.*, 2022). Poor WASH conditions are correlated with increased rates of infections, both in mothers and newborns, as poor hygiene practices during the delivery of a child may result in severe complications (Arowosegbe *et al.*, 2021). Inadequate infection prevention control practices in maternity units increase the risks of many facilities do not meet WHO standards (R *et al.*, 2022). Some women may prefer home deliveries because they are dissatisfied with WASH conditions in healthcare facilities, which may discourage them from accessing health services (Bouزيد *et al.*, 2018).

2.3.3.4 Patient Dissatisfaction and Care-Seeking Behavior

Poor WASH can contribute to significant patient dissatisfaction that may discourage people from seeking necessary health services (Bouزيد *et al.*, 2018). While dissatisfaction does not always hinder the utilization of health-seeking behaviors, it can influence decisions, particularly regarding maternal health, where poor WASH conditions could lead to home deliveries (Bouزيد *et al.*, 2018).

2.3.3.5 Pandemics and Outbreaks

The rapid spread of COVID-19 has highlighted the critical role of WASH in infection prevention and control (IPC) within healthcare facilities, particularly in low-resource settings where limited water access hinders hand hygiene and environmental cleaning (McGriff & Denny, 2020).

A lack of water, sanitation, and hygiene in health care facilities greatly increases the risks during infectious disease outbreaks like COVID-19 and Ebola. Before COVID-19, limited water access in healthcare facilities posed challenges such as inadequate hand hygiene, poor environmental cleanliness, and higher risks of healthcare-associated infections. During the pandemic, these issues have intensified in low-resource facilities within LMICs, where inadequate hand and surface decontamination has been linked to increased SARS-CoV-2 transmission, resulting in severe illness and loss of life among patients and medical personnel (McGriff & Denny, 2020). Poor sanitation and hygiene practices help germs spread, especially in crowded places where many people share few toilets. This is true in Dhaka, where outpatient services had a ratio of 214 patients to 1 toilet (Amin et al., 2024). Poor hand hygiene facilities are helping infections continue, one in three healthcare facilities doesn't have proper hand-washing stations (Nounkeu et al., 2024). During the COVID-19 pandemic, findings from Cameroon described the firsthand challenges faced in their weak health system: limited water availability, lack of personal protective equipment (PPE), and inadequate IPC/WASH structures. Many health facilities lack water entirely, while others face erratic supplies that can last for days or weeks without access to clean, quality water (McGriff & Denny, 2020).

2.3.4 Barriers to Improving WASH Services in Healthcare Facilities in LMICs

Numerous challenges have been identified, including a lack of strong political commitment, insufficiently funded and rarely updated WASH policies in healthcare settings in nearly 75% of countries, significant disparities in WASH facilities based on urban or rural location and type of health establishment, limited data availability on the types and quality of services in healthcare facilities, and the absence of standardized definitions or indicators for a comprehensive assessment or comparison of WASH metrics across countries (Shrivastava et al., 2015). The study of Berihun et al., (2022) revealed the primary challenges in healthcare facilities to include inadequate physical infrastructure, substandard quality of facilities, the absence of dedicated budgets for maintaining WASH services, and the improper utilization of existing WASH facilities. The key barriers to

improved WASH practices identified by the study of Tseole et al., (2022) include rural location challenges, the impacts of climate change, insufficient investments in WASH infrastructure, limited knowledge about water-borne diseases, and a lack of active community engagement. Poor infrastructure and insufficient staff training on WASH practices worsen the challenges in healthcare settings. There is a limited number of high-quality studies evaluating the impact of WASH interventions on healthcare-associated infections (HCAIs) in healthcare facilities across low- and middle-income countries (LMICs), with most research concentrating on hygiene interventions, leaving a significant gap in evidence regarding the effects of water and sanitation services (Watson et al., 2019). Inadequate leadership and limited stakeholder participation frequently result in the ineffective implementation of WASH initiatives (Derso et al., 2022). Years of research reveal that inadequate investment in WASH infrastructure and services in healthcare facilities, often driven by concerns about cost and sustainability, has contributed to the current challenges (McGriff & Denny, 2020). The 2014 GLAAS report (WHO) revealed that, out of 72 countries with national WASH policies, 46 lacked costed or fully implemented plans for water in healthcare facilities. This highlights the need for greater efforts to identify funding sources and financing mechanisms (WHO, 2015). The COVID-19 pandemic highlights the consequences of prioritizing investments in medication supply chains, personnel, and healthcare delivery costs while neglecting the WASH conditions of healthcare facilities. This oversight assumes that effective healthcare and public health protection rely solely on treatment rather than prevention (McGriff & Denny, 2020). A study conducted in Bayelsa, Nigeria, found that none of the healthcare facilities (HCFs) had a WASH monitoring team in place (Ogbonna & Anyanwu, 2024). A significant number of healthcare facilities encounter inefficiencies in cleaning protocols, with the majority facing poor infrastructure conditions. The findings further revealed that the challenges in healthcare facilities stem from inadequate prioritization and insufficient funding for Water, Sanitation, and Hygiene (WASH) initiatives (Washanga & Kaliba, 2024).

2.3.5 Opportunities and Recommendations to Improve WASH Services in LMICs

A shift in perspective is required to recognize WASH as a fundamental pillar of quality healthcare. Health systems have begun integrating WASH into the quality-of-care framework, emphasizing its essential role in ensuring effective and safe healthcare delivery (McGriff & Denny, 2020). Sustaining WASH services, particularly cleaning and safe management of health care waste, requires dedicated, trained and supported staff (World Health Organization, 2020). A study

conducted in 14 LMICs revealed that the presence of infection prevention and control protocols (IPCPs), the appointment of an IPC/WASH focal person at the facility, and the provision of WASH training for staff were positively associated with improved levels of WASH services (Kmentt et al., 2021). Findings from Tseole et al., (2022) revealed the key facilitators for improving WASH practices include enhanced WASH infrastructure, active local community engagement, increased household ownership of latrines, and the development of social capital. WASH must be regarded as non-negotiable components of any healthcare facility (McGriff & Denny, 2020). Developing and enforcing national standards for WASH in healthcare facilities is a key strategy to enhance access and service quality (WHO, 2015). Effective monitoring mechanisms are required to ensure the consistent collection, reporting, and analysis of data on WASH services (Geneva: World Health Organization, 2020). Similarly, the study of Ogbonna and Anyanwu (2024) advocates for the establishment of WASH monitoring teams and focal persons in all HCFs to ensure the adequate provision and management of WASH services. An integrated strategy that addresses water supply, sanitation, hygiene, and waste management is essential for effective WASH service delivery (Washanga & Kaliba, 2024). Local ownership at the district level, such as by the district health office or council, and within the community, plays a crucial role in sustaining progress (Geneva: World Health Organization, 2020). Studies by Washanga and Kaliba (2024) similarly highlight that involving local communities and health committees promotes ownership and accountability, thereby enhancing the sustainability of WASH interventions. Increased investment in WASH infrastructure was recognized as a key enabler of improved WASH practices (Tseole et al., 2022). Investing in WASH provides significant value, with appropriate technologies available to address needs even in the most remote and resource-limited areas (World Health Organization, 2020). There is a need to prioritize WASH in healthcare investments, reexamine health system norms, and foster cross-sector collaboration between WASH and health professionals to ensure quality healthcare (McGriff & Denny, 2020).

2.4 WASH in Healthcare Facilities in Ghana

2.4.1 Overview of WASH standards in healthcare facilities in Ghana

The WHO/UNICEF benchmarks stress the importance of universal access to safe water and sanitation, a standard that Ghana continues to face challenges in achieving (Ashinyo et al., 2021). The JMP monitoring report reveals that 66.95% of healthcare facilities in Ghana have basic water services, while around one-third (32.58%) have limited access to water, and 0.47% lack water services entirely. Regarding hygiene, 57.13% of healthcare facilities have basic hygiene services, 39.54% have limited access, and 3.32% lack hygiene facilities altogether. For waste management, 30.79% of healthcare facilities have basic services, 49.41% have limited services, and 19.80% have no waste management services (JMP,2024). Data on sanitation facilities is currently unavailable for Ghana (JMP,2024). A study of 1,646 healthcare facilities in Ghana revealed that basic WASH service coverage was 69% for water, 58% for sanitation, and 64% for hygiene, highlighting existing service provision but significant gaps in achieving universal access(Dubik et al., 2024). This service deficiency undermines the capacity to deliver fundamental healthcare services, such as childbirth assistance, and hampers efforts to prevent and manage infections (WHO, 2015). An assessment of WASH in healthcare facilities in an urban district in Ghana showed that hand hygiene had the highest compliance, meeting 70% of the required standards. This was followed by water at 64%, while sanitation and healthcare waste management had significantly lower compliance rates, at 30% and 20.8%, respectively. The management domain was the weakest in the assessment, with only 4.5% of its indicators meeting the required standards, highlighting significant shortcomings in managing WASH activities(Anum Doku et al., 2022). An assessment of seven COVID-19 Treatment Centers (TCs) in Ghana using the WHO/UNICEF Water and Sanitation for Health Facility Improvement Tool (WASH FIT) revealed varying levels of compliance across different domains. The water domain had the highest number of indicators meeting standards, with an average score of 90.5%) across the seven TCs, followed by management (66.9%) and hygiene (58.7%). However, the TCs performed poorly in the sanitation and healthcare waste domain, with an average score of 44.6%. These findings underscore the challenges faced by COVID-19 TCs in implementing adequate WASH services (Ashinyo et al., 2021). According to WaterAid Ghana's national evaluation, out of the 18 Health Care Facilities surveyed in the WA Municipality, only one had access to piped water onsite. In the remaining 17

facilities, healthcare workers and visitors depended on boreholes located on the premises or communal boreholes, with some relying on water deliveries from tankers (Bangladesh & Abdullah, 2020). A survey conducted in 29 HCFs in the Bongo and Kassena Nankana West districts of Ghana found that 76% of the facilities have continuous access to water, 49% have toilet facilities, and 93% have handwashing facilities located near treatment areas (WaterAid, 2021).

2.4.2. Barriers to Improving WASH Services in Healthcare Facilities in Ghana

A study by Dubik et al., (2024) revealed notable regional disparities in access to basic WASH services, with newly established regions and those in Northern Ghana being particularly disadvantaged. Addressing these geographical inequities is essential to achieving equitable access to WASH services nationwide. A study by Anum Doku et al., (2022) revealed a significant number of facilities lacked essential logistics, which are critical for effective WASH implementation and the absence of a written WASH plan and inadequate orientation for healthcare professionals were key factors contributing to the poor performance of WASH. The assessment highlighted an urgent need for enhanced infrastructure and resources to improve sanitation and healthcare waste management. Dubik et al., (2024) found out the key factors affecting the availability of basic WASH services in healthcare facilities include their location, the level of service delivery, and the presence of trained personnel, such as a facility-based assistant WASH manager. These elements are essential for enhancing WASH service provision in healthcare settings. Findings from Appiah-Effah et al., (2019) reveal that low sanitation levels are primarily influenced by complex economic, institutional, and sociocultural factors, including insufficient financial commitment, ineffective policy implementation, negative attitudes and perceptions toward sanitation, and the widespread reliance on shared and public toilets. The public WASH sector faced a shortage of technical personnel, attributed to unattractive working conditions, high attrition rates, and a lack of qualified graduates to fill vacant roles. Additionally, weak institutional arrangements and insufficient commitment to implementing policies for developing adequate human resource capacity exacerbated the problem (Oduro-Kwarteng et al., 2015)

2.4.3 Opportunities and recommendations for improving WASH services in Ghana

The findings by Dubik et al. (2024) highlight the urgency of policy interventions to prioritize investments in WASH-deprived facilities and regions. Key recommendations include providing

training and capacity building for WASH management personnel and integrating adequate WASH services into the design and construction of new healthcare facilities. The assessment of WASH in healthcare facilities in an urban district in Ghana by Anum Doku et al., (2022) highlighted the critical importance of training healthcare professionals on WASH practices and addressing the urgent need for adequate sanitation and healthcare waste management logistics in these facilities. Implementing targeted programs to address regional inequities, especially in Northern Ghana, is crucial for improving equitable access to WASH services across the country (Dubik et al., 2024). Establishing comprehensive policies with well-defined standards and stakeholder roles is crucial for achieving sustainable improvements in WASH services (Shrivastava et al., 2015). Appointing trained WASH-IPC managers and offering education to healthcare staff are vital steps toward ensuring the effective management and utilization of WASH facilities (Dubik et al., 2024).

2.5 Theoretical Frameworks and Indicators

2.5.1 Theoretical frameworks used to assess WASH in healthcare settings

Water and Sanitation for Health Facility Improvement Tool (WASH FIT)

Developed by the World Health Organization (WHO) and UNICEF, WASH FIT is a risk-based management tool designed for healthcare facilities, addressing critical components of WASH services, including water, sanitation, hand hygiene, environmental cleaning, healthcare waste management, and selected aspects of energy, building, and facility management. WASH FIT offers a framework for developing, monitoring, and continuously implementing improvement plans that address infrastructure, behaviors, and operations and maintenance. It also prioritizes WASH actions that are climate-resilient, equitable, and inclusive. WASH FIT facilitates the planning and execution of WASH improvements within broader quality improvement (QI) initiatives. It helps meet local, national, and global standards while supporting the implementation of infection prevention and control (IPC) standards and transmission-based precautions in line with national guidelines and standard operating procedures (SOPs). WASH FIT promotes multisectoral collaboration by uniting all stakeholders responsible for delivering WASH services, including policymakers, legislators, district health officers, hospital administrators, water and sanitation engineers, climate and environmental experts, and service users. By early 2022, WASH FIT had

been implemented in over 40 countries across all continents, predominantly in small, primary healthcare facilities within low-resource settings. (World Health Organization, 2022).

Integrated Behavioral Model for Water, Sanitation, and Hygiene (IBM-WASH)

The IBM-WASH is an all-encompassing framework aimed at improving behavior change interventions related to WASH practices, especially in settings with limited infrastructure. The essential components and insights derived from the model are the **Contextual Dimension** which refers to the factors related to the individual, setting, and environment that can influence behavior change and the adoption of new technologies. It stresses the role of the surrounding context in shaping WASH behaviors. The **Psychosocial Dimension** examines the behavioral, social, and psychological factors that affect outcomes and the adoption of technology. It emphasizes how social interactions and personal beliefs influence WASH practices and the **Technological Dimension**, focuses on the features of technologies, products, or devices that can affect their adoption and continued use. It acknowledges that the success of WASH interventions often depends on the specific characteristics of the technology involved. The primary objective of IBM-WASH is to offer both a theoretical and practical framework that can steer the design and assessment of effective WASH interventions. It aims to ensure that these interventions are based on a thorough understanding of the behavioral factors that influence WASH practices (Dreibelbis et al., 2013).

The Health Belief Model

The **Health Belief Model (HBM)** is a psychological framework designed to explain health behaviors. It posits that individuals' health-related actions are shaped by their perceptions of risks and benefits. This model is particularly effective in public health initiatives aimed at promoting behavior change, such as enhancing Water, Sanitation, and Hygiene (WASH) practices among mothers of children under five in urban slum areas. The HBM consists of several key components that influence health-related behaviors: **Perceived Susceptibility** refers to the individual's belief about how likely they are to experience a particular health issue. **Perceived Severity** refers to the belief about the seriousness and potential consequences of the health issue. **Perceived Benefits** refer to the belief that taking a specific action can effectively reduce the risk or severity of the health issue. **Perceived Barriers** refers to the perceived challenges or obstacles that may hinder

individuals from taking the necessary action. **Self-efficacy** refers to the confidence in one's ability to successfully perform the action needed to address the health issue (Orivri, 2023).

Integrated WASH Assessment Tool

While various tools exist to evaluate WASH services in both household and non-household contexts, they have certain limitations, and none adopts a comprehensive approach to assess WASH performance across all non-household settings. Additionally, the effects of climate change on WASH services are often overlooked in these evaluations, exacerbating existing service deficiencies. To bridge these gaps, an integrated tool has been developed to assess WASH performance in non-household settings, factoring in financial, institutional, environmental, technical, social, and climate change considerations. This tool generates indicator scores to address the lack of aggregated data, enabling decision-makers to evaluate WASH performance levels in a given setting. It also provides qualitative insights for each score, helping decision-makers pinpoint areas needing improvement. The tool delivers valuable data to enhance WASH facilities and ensure sustainable services, particularly benefiting WASH service providers and local governments (Win et al., 2024).

2.5.2 Indicators used to measure water, sanitation, and hygiene standards in HCFs

The most frequently used healthcare facility surveys are the Service Availability and Readiness Assessment (SARA), the Service Delivery Indicator survey (SDI), and the Service Provision Assessment (SPA). These surveys are typically nationally representative and conducted by international organizations (WHO, 2015). The definitions and measurement methods for water and sanitation indicators vary across different assessments. Additionally, the indicators used often do not meet the minimum standards set by the World Health Organization (WHO). However, SARA is in the process of updating its indicators to reflect WHO standards, and all three are working to harmonize their definitions of WASH

Water Indicators

Most health care facility assessments use the JMP classification for drinking-water sources to define an improved water source, but the definitions of access vary between surveys. For example, SARA defines access as having an improved water source within 500 meters of the facility, while SDI simply defines it as access to an improved water source. SPA, on the other hand, records year-

round availability of water from an improved source within 500 meters of the facility. Therefore, both SARA and SPA would consider a facility with no water source on-site to still have water services if the source is within 500 meters, setting a low standard that does not meet the WHO's basic WASH standards, which require water to be available within the facility itself (WHO, 2015).

Sanitation indicators

While most assessments define the physical sanitation facility using the uniform criteria of improved sanitation as outlined by the JMP, the definition of access varies. For instance, SDI defines access as the availability of one or more functioning flush toilets or latrines as observed by an enumerator. In contrast, SARA relies on reported data rather than direct observation, which may lead to inaccurate information about the functionality and accessibility of the facilities. Additionally, none of the surveys assess whether the number of toilets is sufficient for the number of people using the facility or if they are easily accessible to patients with limited mobility (WHO, 2015).

Hygiene Indicators

The most commonly used indicator for hygiene was the availability of soap and water or alcohol-based hand rubs at key points of care. However, none of the surveys indicated whether hygiene facilities were accessible to patients. Such details are usually part of the assessment section, which covers various infection prevention and control items. Compared to sanitation, there was less data available on hygiene facilities, and no information was provided on their functionality or frequency of use (WHO, 2015).

2.6 Gaps in Literature and Contextual Challenges

There is a significant lack of comprehensive data on WASH in these facilities regarding geographic coverage and the types of services available (WHO, 2015). Global coverage estimates for water, sanitation, hygiene, waste management, and environmental cleaning in 2023 could not be determined due to a lack of sufficient data. Data on sanitation facilities is currently unavailable for Ghana (JMP, 2024). There is no standardized definition of WASH services, and many assessments overlook critical aspects such as water safety, reliability, and the functionality of sanitation services (WHO, 2015). While various tools exist to assess WASH services in both household and non-household settings, they are limited in scope, and none provides a comprehensive evaluation

of WASH performance across all non-household environments(Win et al., 2024). Additionally, the effects of climate change on WASH services are seldom accounted for in these assessments, exacerbating the deficiencies in WASH services(Win et al., 2024). These global monitoring data, while alarming, fail to capture the daily challenges healthcare providers in LMICs face due to limited water supply(McGriff & Denny, 2020). While WASH interventions are considered crucial for preventing healthcare-associated infections (HCAIs), no systematic reviews have been conducted to date(Watson et al., 2019).

2.7 Conceptual Framework

The conceptual framework serves as a visual and structured representation of the key variables and relationships involved in assessing Water, Sanitation, and Hygiene (WASH) standards in healthcare facilities in the Bawku West District, Ghana. The conceptual framework below connects the independent variables (WASH components) with the dependent variable (overall WASH standards in healthcare facilities).

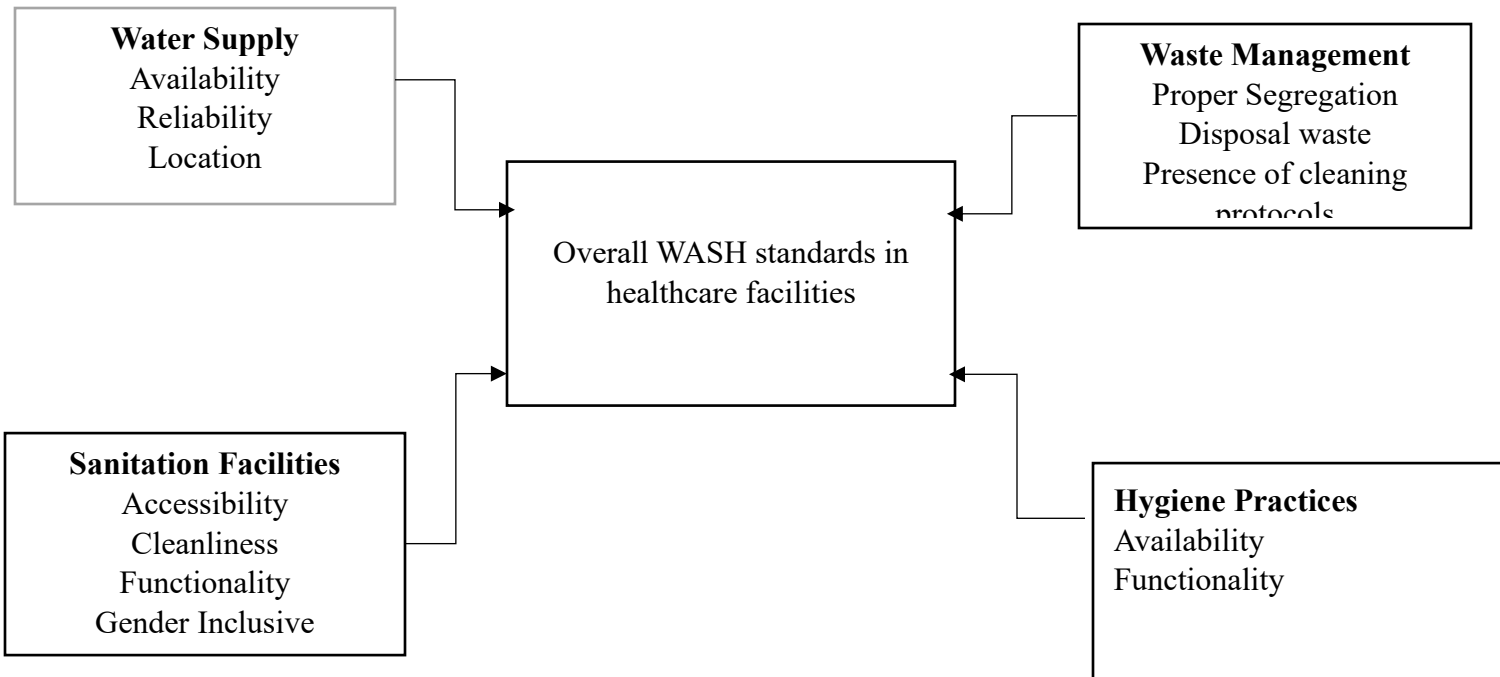


Figure 1: Conceptual Framework

Source: Authors Construct, 2025

The conceptual framework visually represents the key components that influence Water, Sanitation, and Hygiene (WASH) standards in healthcare facilities within the Bawku West District, Ghana. It establishes a link between independent variables (WASH components) and the dependent variable (overall WASH standards in healthcare facilities).

Water Supply

Water supply is a fundamental determinant of WASH standards, as it affects hygiene and sanitation within healthcare facilities. This component considers availability, ensuring that facilities have a continuous and adequate supply of water for essential activities such as handwashing, cleaning, and medical procedures. Reliability refers to the consistency of water access without frequent shortages. Location assesses how accessible the water source is to healthcare workers, patients, and visitors, as distant or hard-to-reach water sources can limit proper hygiene practices. The availability of clean and sufficient water is crucial for reducing healthcare-associated infections and ensuring effective patient care (Bouzid et al., 2018).

Sanitation Facilities

Sanitation facilities play a crucial role in infection prevention and patient well-being. Accessibility ensures that toilets and handwashing stations are within reach for all users, including persons with disabilities. Cleanliness is a key indicator of a well-maintained facility, as unhygienic conditions can lead to disease outbreaks. Functionality refers to whether the sanitation facilities are operational, with adequate water, soap, and privacy. Additionally, gender inclusivity is important to cater to the needs of both male and female users, ensuring dignity and comfort for all. Studies show that poor sanitation infrastructure significantly affects patient health outcomes and increases the risk of disease transmission in healthcare settings (Cronk & Bartram, 2018).

Waste Management

Effective waste management is necessary to prevent infections and environmental contamination. This component includes proper segregation of medical and general waste to reduce health risks. Disposal of waste ensures that hazardous materials, such as used syringes and biological waste, are managed safely. The presence of cleaning protocols signifies structured guidelines for waste handling, disposal, and facility disinfection to maintain hygiene standards (WHO, 2021). Poor

waste management practices in healthcare settings contribute to environmental pollution and increase the spread of infections (Haque et al., 2020).

Hygiene Practices

Hygiene practices in healthcare facilities ensure that both staff and patients adhere to proper sanitation measures. Availability refers to the presence of hygiene materials such as soap, disinfectants, and handwashing stations. Functionality ensures that these hygiene facilities work effectively to support infection control efforts, reducing the spread of diseases within healthcare environments. Research has shown that improved hand hygiene significantly reduces hospital-acquired infections and promotes overall public health safety (Allegranzi et al., 2017).

Overall WASH Standards in Healthcare Facilities

The dependent variable in the framework represents the overall quality of WASH standards in healthcare settings. The efficiency of water supply, sanitation, waste management, and hygiene practices collectively determine the level of cleanliness, infection control, and service delivery in hospitals and clinics. An integrated and well-maintained WASH system is essential for improving healthcare outcomes and patient safety (UNICEF, 2019). Proper implementation of WASH standards enhances healthcare efficiency and reduces mortality rates linked to poor hygiene conditions (Bouzid et al., 2018).

CHAPTER THREE

METHODOLOGY

3.1 Introduction

This chapter describes the study area and presents information on the type of research design adopted for the study, the study population, sample size and sampling techniques, data sources, collection methods and tools, data analysis and presentation as well as ethical considerations and study limitations.

3.2 Study Area Description

Bawku West District is one of the thirteen districts located in the Upper East Region of Ghana. The district is situated in the northeastern part of the region, with Zebilla as its administrative capital (GSS, 2014). The District is located approximately between latitudes 10° 30'N and 11° 10'N, and between longitudes 0° 20'E and 0° 35'E and spans a land area of 1,096 km² with a population density of 131.5 persons per square kilometer. The district comprises roughly 12% of the total land area of the Upper East Region, making it the second-largest district in terms of land area within the region (Bawku West Municipal, 2022). It shares borders with the Republic of Burkina Faso to the north, Binduri District to the east, Talensi and Nabdam Districts to the west, and East Mamprusi District to the south (GSS, 2024). The population of Bawku West District in 2021 was 144,189, comprising 73,408 females (50.9%) and 70,781 males (49.1%) (GSS, 2021). The primary occupation of the people in the district is agriculture, with approximately 80% of the labor force engaged in activities such as crop farming, animal rearing, and fishing. The district comprises 174 communities and is served by a total of 58 health facilities, distributed as follows: one hospital, nine health centers, eight clinics (two public and six private), 37 Community Health Planning and Services (CHPS) compounds, two supplementary feeding centers, and one nutrition rehabilitation center (Bawku West Municipal, 2022).

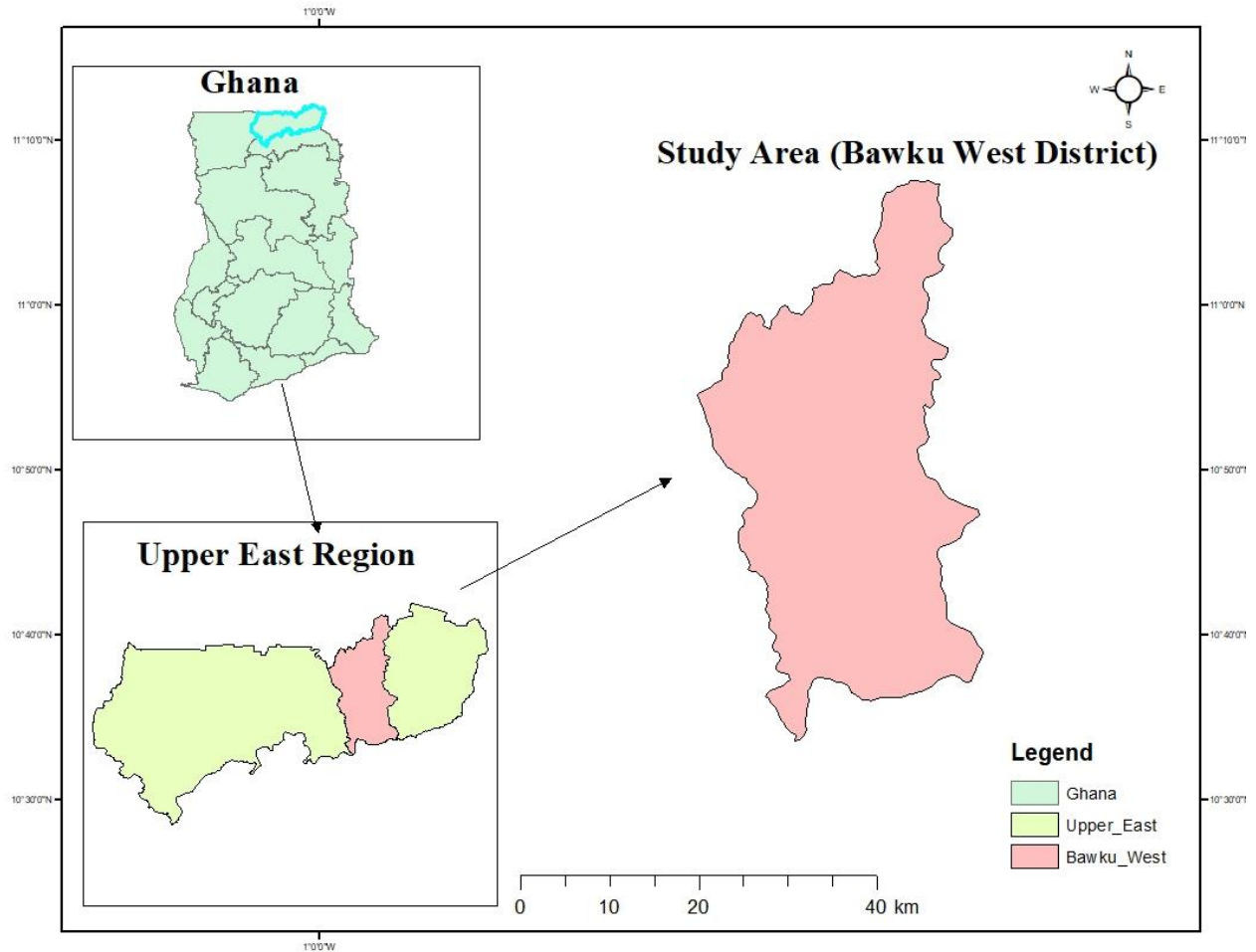


Figure 2: Map of Bawku West District (Author`s construct 2024)

3.3 Research Design

The nature of the research questions and objectives of this study dictated the use of a mixed methods research design. Mixed method designs are those that incorporate at least one quantitative method and one qualitative method, with neither method being intrinsically tied to a specific research paradigm (Greene et al., 1989). The quantitative methods addressed research questions concerning the availability, functionality, and accessibility of WASH services in healthcare facilities. This was achieved using the core questions and indicators developed by the WHO and UNICEF Joint Monitoring Program for evaluating WASH service levels in these facilities. Qualitative methods were employed to address research questions aimed at identifying gaps and areas for improvement in WASH services. These methods also analyzed the key challenges and

opportunities for enhancing WASH standards in healthcare facilities. Applying the mixed method approach gives freedom of choice, to choose the methods, techniques, and procedures of research that best meets the needs and purpose of the study (Creswell, 2003). Mixed methods research studies leverage the strengths of both quantitative and qualitative approaches, offering an innovative strategy for tackling WASH related problems in healthcare facilities (Alatinga & Williams, 2019). The study adopted concurrent procedures in which qualitative and quantitative data were collected simultaneously during the study and the information integrated and interpreted (Fetters et al., 2013).

3.4 Study Population

The study population encompassed all health centers, medical centers, clinics, CHPS, and health workers under the facilities in Bawku West District. Data collected from the district health directorate indicate there are 36 CHPS, 9 Clinics, 9 health centers, 2 medical centers in the district and 310 health workers under the facilities. The study population, therefore, comprised 56 healthcare facilities and 310 health workers.

3.5 Study Variables

The study variables were the status of WASH services in healthcare facilities, categorized into three levels: basic, limited, and no service. The classification of WASH service status was based on the WHO/UNICEF Joint Monitoring Program (JMP) healthcare facility WASH standards. The five key indicators of WASH services were assessed individually and assigned to a three-level service ladder (basic, limited, and no service) in accordance with the JMP framework (WHO/UNICEF, 2023) (Table 1).

3.6 Sample Size and Sampling Technique

3.6.1 Sampling Procedure and Size Determination for Quantitative Study

Sample Procedure

For the quantitative studies, a two-staged sampling procedure was employed to select healthcare facilities and the respondents within those facilities for the study. This approach ensures a systematic and representative selection process, facilitating the collection of reliable and generalizable data from health workers in various healthcare facilities.

In the first stage, the healthcare facilities and workers were selected using stratified sampling technique. The healthcare facilities and workers were first stratified by eight sub-districts to ensure each sub-district was proportionally represented in the study. The sub-districts are Binaba Sub-district, Boya Gbantongo Sub-district, Sapelliga Googo Sub-district, Tanga Timonde Sub-district, Tilli Widnaba Sub-district, Zebilla North Sub-district, Zebilla South Sub-district and Zongoire

In the second stage, the facilities were randomly selected from each stratum using the lottery method to ensure fair representation of all the sub-districts and convenience sampling was employed for the health workers. In each selected facility, health workers available and willing to participate during the survey period were included.

Sample Size Determination

To determine the sample size for the quantitative study, Slovin's formula, Slovin, E. (1960) was used. It provides an easy way to calculate an appropriate sample size based on the population size and a desired margin of error. The formula is

$$n = \frac{N}{1 + Ne^2}$$

Where:

- n is the sample size
- N is the population size of health facilities (56) or health workers (310)
- e is the margin of error (as a decimal) = 0.05 with a confidence level of 95%

Sample Size for Healthcare Facilities

$$n = \frac{56}{1 + 56 (0.05)^2} = 49$$

The sample size of the healthcare facilities = 49

Sample Size for Health Workers

$$n = \frac{310}{1+310(0.05)^2} = 175$$

The sample size of the health workers = 175

Proportional allocation of sample across the eight sub-districts with a 5% margin of error:

$$ni = \frac{Ni}{N} \times n$$

Where:

- Ni = Total number of health facilities or workers in a sub-district
- N= Total number of health facilities (56) or workers (310) in the district
- n = Total sample size of health facilities (49) or workers (175)

Table 2. Proportional allocation of the 49 healthcare facilities across the eight sub-districts

Sub-District	Total Health Facilities (Ni)	Sampled Facilities (ni)
Zebilla South	14	14/56 x 49 = 12
Binaba	9	9/56 x 49 = 8
Sapelliga Gogo	8	8/56 x 49 = 7
Boya/Gbantongo	7	7/56 x 49 = 6
Tanga Timonde	5	5/56 x 49 = 4
Tilli Widnaba	5	5/56 x 49 = 4
Zebilla North	4	4/56 x 49 = 4
Zongoire	4	4/56 x 49 = 4
Total	56	49

Table 3. Proportional allocation of the 175 healthcare workers across the eight sub-districts

Sub-District	Total Health Facilities	Sampled Health Facilities	Total Health Workers	Sampled Workers
Zebilla South	14	12	48	27
Binaba	9	8	52	29
Sapelliga Googo	8	7	37	21
Boya/Gbantongo	7	6	31	18
Tanga Timonde	5	4	47	27
Tilli Widnaba	5	4	38	21
Zebilla North	4	4	30	17
Zongoire	4	4	27	15
Total	56	49	310	175

3.6.2 Sample Procedure and size for Qualitative Study

For the qualitative study, purposive sampling was used to select the respondents that satisfied the objectives of the study. Purposive sampling techniques are predominantly utilized in qualitative studies, involving the selection of units based on specific criteria aligned with addressing the research study's questions (Teddlie & Yu, 2007). The sample size of the qualitative study was seven (7) key informants including WASH focal persons, facility managers and the health promotion officer from the district health directorate, were purposively selected for interviews. (Vasileiou, et al, 2018) highlight that in qualitative research, particularly interview-based studies, selecting a smaller sample size is often appropriate due to the depth and richness of data obtained from each participant. They emphasize that qualitative research aims to explore complex phenomena in detail, and smaller samples allow for more intensive engagement with participants, leading to nuanced insights. The authors also note that the concept of data saturation; where no new themes or information emerge from additional data collection is commonly used to justify sample sizes in qualitative studies. Achieving saturation ensures that the data collected are sufficient to understand the research phenomenon comprehensively. These respondents were informative and possessed the required information about the study. They were interviewed to identify gaps and areas for improvement of WASH in healthcare facilities and to also understand the key challenges and opportunities for improving WASH standards in healthcare facilities

3.7 Data Collection Methods and Tools

3.7.1 Quantitative Data Collection Method and Tool

A survey was used to collect quantitative data for this study. The data was gathered using semi-structured questionnaires adapted from the core questions and indicators developed by the WHO and UNICEF Joint Monitoring Program for assessing WASH (Water, Sanitation, and Hygiene) service levels in healthcare facilities (WHO and UNICEF, 2018). The core indicators define "basic," "limited," and "no" service levels for water, sanitation, and hygiene. This classification applies to healthcare facilities of all types and sizes, from primary to tertiary levels (WHO and UNICEF, 2018).

The semi-structured questionnaires were used to collect primary data from healthcare workers in the selected facilities, ensuring that responses aligned with the objective of the study and global WASH assessment standards.

3.7.2 Qualitative Data Collection Method and Tool

The study employed face-to-face, in-depth interviews to collect qualitative data from key informants, including healthcare facility managers, WASH focal persons, and officers from the district health directorate. A semi-structured interview guide was used to conduct the interviews with seven (7) key informants to ensure consistency while allowing flexibility for deeper insights. These key informants were selected based on their expertise and relevance to the study objectives, as they possess valuable knowledge on WASH standards and challenges in healthcare facilities.

3.8 Data Processing and Analysis

3.8.1 Quantitative Data Processing and Analysis

Data analysis is, making meaning out of the data collected. Descriptive analysis was carried out on quantitative data using Statistical Packages for Social Sciences (SPSS) version 27 to assess the current WASH standards in healthcare facilities. Descriptive statistics was used to compute the percentage of availability, functionality and accessibility of water, sanitation, and hygiene services across healthcare facilities in the Bawku West District. The results were presented in tables and figures for easy interpretation. Additionally, frequency distributions were employed to identify variations across different healthcare facilities.

3.8.2 Qualitative Data Processing and Analysis

Qualitative data was analyzed using thematic analysis. All qualitative data, including interview transcripts from key informant interviews (KIIs), were thematically analyzed. The thematic analysis involved identifying key themes related to WASH standards, gaps, and challenges in healthcare facilities. A coding framework was developed based on emerging patterns from the data, and relevant quotes were extracted to support the findings. The integration of direct responses from key informants enhanced the interpretation of quantitative results, ensuring a comprehensive understanding of the WASH situation in healthcare facilities. Thematic analysis enhanced the credibility and validity of findings through a systematic examination and interpretation of qualitative data.

3.9 Ethical consideration

An ethical approval letter was obtained from Regional Health Directorate of the Ghana Health Service. Official permission was sought from the Director of the District Health Service, ensuring proper authorization for the research. Consent was acquired from each participant before the interview, with the objectives of the research clearly explained to the respondents. Additionally, assurances were provided that all data collected would be used solely for academic purposes. The privacy and anonymity of respondents were maintained throughout the research.

3.10 Limitations of Study

The limitations of this study include the reluctance of healthcare workers to participate in the survey leading to delay and slower responses, the presence of only a single health worker in some healthcare facilities, limiting available responses and difficulties in accessing the healthcare facilities due to their vast geographical distribution and poor road networks leading to delays in data collection. However, appropriate measures were taken to mitigate their impact. Facility heads were engaged beforehand to build trust, flexible data collection schedules were implemented, and anonymity was assured. All 175 responded to the interview.

CHAPTER FOUR RESULTS AND DISCUSSION

4.1 Introduction

This chapter presents the results obtained from the study. The results are presented under the specific objectives. The socio-demographic characteristics of the respondents are presented first after which the results on the specific objectives are presented.

4.2 Socio-Demographic Characteristics of the Respondents

Table 4 shows a total of 175 respondents participated in this study. The gender distribution indicated that 95 (54.3%) respondents were female, while 80 (45.7%) were male. The sample was relatively balanced in gender representation, with a slightly higher proportion of female respondents. The age distribution revealed that the majority of respondents were between 25 and 34 years old (n = 115, 65.7%), followed by those aged 35–44 years (n = 50, 28.6%). Smaller proportions of respondents were aged 18–24 years (n = 3, 1.7%), 45–54 years (n = 6, 3.4%), and 55–60 years (n = 1, 0.6%). This suggests that most respondents were young to middle-aged adults, likely representing the primary working age group in healthcare facilities. In terms of roles within healthcare facilities, the majority of respondents were health workers (n = 156, 89.1%), followed by facility managers (n = 16, 9.1%), cleaners (n = 1, 0.6%), and those categorized as "other" (n = 2, 1.1%). The high percentage of health workers suggests that the study largely reflects perspectives from those directly engaged in patient care and WASH-related practices in healthcare settings. These socio-demographic characteristics provide important context for understanding the perspectives on WASH standards in healthcare facilities in the Bawku West District. Table 4 details the socio-demographic characteristics of the respondents.

Table 4: Socio-demographic characteristics of respondents (n = 175)

Variables		Frequency	Percent	Cumulative Percent
Gender	Male	80	45.7	45.7
	Female	95	54.3	100
Age	18-24	3	1.7	1.7
	25- 34	115	65.7	67.4
	35-44	50	28.6	96.0
	45-54	6	3.4	99.4
	55-60	1	0.6	100
Role	Facility Manager	16	9.1	9.1
	Health Worker	156	89.1	98.3
	Cleaner	1	0.6	98.9
	Other	2	1.1	100
	Total	175	100	

Source: Field Survey, 2025

4.3 Assessment of Wash Standards in Health Facilities

4.3.1 Availability of Water in Healthcare Facilities

Table 5 shows an assessment of the availability of water in the 49 health facilities surveyed. Water availability is a critical component of WASH standards in healthcare facilities. The findings indicate that 160 respondents (91.4%) from 36 health facilities reported that water was available from the main supply at the time of the survey. Another 15 respondents (8.6%) from 6 facilities indicated that water was not available at the time of the survey.

This suggests that while the majority of healthcare facilities have access to water, 6 health facilities (14.3%) still face water insecurity, which could pose challenges to hygiene and infection control.

These findings align with UNICEF (2020), which reported that inconsistent water supply remains a major barrier to achieving sustainable healthcare WASH standards in Sub-Saharan Africa.

Table 5: Availability of water in Healthcare Facilities

		Frequency	Percent	Cumulative Percent
Responses	No	15	8.6	8.6
	Yes	160	91.4	100.0
	Total	175	100.0	

Source: Field Survey, 2025

4.3.2 Main Water Source in Healthcare Facilities

Table 6 shows an assessment of the water sources in the 49 health facilities surveyed. Access to a reliable water source is essential for maintaining hygiene and infection prevention standards in healthcare facilities. The findings reveal that tube wells and boreholes (37.7%) were the predominant source of water across 16 facilities, indicating reliance on underground water extraction. Piped water (33.1%) was the second most common water source, utilized in 14 facilities. This suggests that a significant number of healthcare facilities relied on centralized water systems, which could be subject to service interruptions or water quality concerns. Seven facilities (11.4%) reported having no water source at all, indicating severe water insecurity. Approximately 16.7% of healthcare facilities lack dedicated water source. In addition, alternative water sources such as protected dug wells (1.1%), unprotected dug wells (0.6%), and tanker trucks (3.4%) were used in a few facilities

Table 6: Main Water Source in Healthcare Facilities

Water Sources	Frequency	Percent	Cumulative Percent
Tube well/Borehole	66	37.7	37.7
No water source	20	11.4	49.1
Other	22	12.6	61.7

Piped	58	33.1	94.9
Protected dug well	2	1.1	96.0
Unprotected dug well	1	0.6	96.6
Tanker truck	6	3.4	100.0
Total	175	100.0	

Source: Field Survey, 2025

4.3.3 Reliability of Water Supply in Healthcare Facilities

Table 7 reveal that 149 out of 175 respondents (84.6%) reported daily water availability from their main water source, spanning 34 out of 49 healthcare facilities. This suggests that a majority of the facilities have relatively stable water access. However, intermittent supply remains an issue, with 6 respondents (3.4%) from 3 facilities experiencing weekly interruptions, while 3 respondents (1.7%) from 2 facilities reported monthly disruptions. Eleven respondents (6.3%) from 4 facilities indicated that water was rarely available, and 7 respondents (4.0%) from 3 facilities reported that water was never available. Key informants confirmed these findings, emphasizing practical challenges they encounter daily., One respondent remarked: *“Water is a big challenge in our facility. Sometimes, we have to rely on nearby boreholes, but they are not always functional. This makes it difficult to maintain proper hygiene, especially during deliveries and surgical procedures.”* (WASH focal person, Yarigu Health Centre, 2025). This lack of reliable water affects hygiene maintenance in critical areas, including labour wards, surgical units, and general patient care. Without sustainable solutions, infection risks remain high.

Table 7: Reliability of Water Supply in Healthcare Facilities

	Frequency	Percent	Cumulative Percent
Daily	149	84.6	84.6
Weekly	6	3.4	88.0
Monthly	3	1.7	89.7
Rarely	11	6.3	96.0
Never	7	4.0	100.0

Total	175	100.0	
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Source: Field Survey, 2025

4.3.4 Sanitation Facilities, Usable Toilets and Menstrual Hygiene Facilities

The number of available and functional toilets is essential for maintaining hygiene in healthcare facilities. The Findings revealed that 44 respondents (25.1%) from 13 facilities reported having no usable toilets, while 50 respondents (28.6%) from 15 facilities had only one toilet available. Only 11.4% (20 respondents from 6 facilities) had four toilets, and a small proportion (0.6%, 1 respondent from 1 facility) reported having 10 or more toilets. Key informants confirmed these findings, emphasizing practical challenges they encounter daily. One nurse pointed out that, *"Our facility lacks proper toilet facilities for both staff and patients. In some cases, patients have to share restrooms with visitors, which raises hygiene concerns"* (nurse, Kobogo CHPS, 2025).



Figure 3: Pictures of Toilet Facilities in some Health Facilities

Source: Field Survey, 2025

The most common toilet types were flush/pour-flush to sewer (26.9%), found in 12 facilities, and flush/pour-flush to a tank or pit (23.4%), reported in 10 facilities. However, 9.7% of respondents (from 4 facilities) reported the use of pit latrines without slabs, and 25.7% (from 13 facilities)

indicated that there were no toilet facilities at all. The lack of proper sanitation facilities presents a major challenge for infection control and hygiene in healthcare settings.

The findings also show that 59 respondents (33.7%) from 15 facilities reported that female toilets had at least one type of menstrual hygiene facility, while 45 respondents (25.7%) from 13 facilities reported the presence of only two types of facilities. A study by WHO (2019) also found that many healthcare facilities in low-resource settings lack separate toilets for male and female staff and patients, contributing to hygiene-related challenges.

4.3.5 Handwashing Facilities and Hygiene Supplies

Regarding functional handwashing stations near toilets, table 8 reveals that, 104 respondents (59.4%) from 24 facilities confirmed their presence within 5 meters of the toilets. However, 44 respondents (25.1%) from 11 facilities reported that there were no handwashing stations near toilets, and 13 respondents (7.4%) from 5 facilities noted that while handwashing stations existed, they lacked soap or water. Key informants confirmed these findings. For example, a midwife from one of the clinics mentioned that, *"Handwashing facilities are present, but the challenge is that we don't always have soap or hand sanitizers. This makes infection prevention difficult, especially in maternity wards."* (Midwife, Sapelliga Health Centre, 2025).

Table 8: Functional handwashing facilities

Functional handwashing facility	Frequency	Percent	Cumulative Percent
Yes, within 5 m of toilets	104	59.4	59.4
No, there are handwashing facilities near the toilets but lacking soap and/or water	13	7.4	66.9
No, no handwashing facilities near toilets (within 5 meters)	44	25.1	92.0
Other	14	8.0	100.0
Total	175	100.0	

Source: Author's Field Survey, 2025

Hand hygiene is a key component of infection prevention in healthcare settings. Table 9 below shows that the availability of soap and water (or alcohol-based hand rub) in consultation rooms was reported by 147 respondents (84.0%) from 34 facilities. 16 respondents (9.1%) from 5 facilities indicated that these resources were unavailable, and 12 respondents (6.9%) from 3 facilities reported partial availability due to a lack of materials.

Table 9: Soap and water (or alcohol-based hand rub) currently available in consultation rooms

Soap and water (or alcohol-based hand rub) currently available in consultation rooms	Frequency	Percent	Cumulative Percent
Yes	147	84.0	84.0
No	16	9.1	93.1
Partially (e.g., lacking material)	12	6.9	100.0
Total	175	100.0	

Source: Author's Field Survey, 2025



Figure 4: Pictures of Handwashing Facilities in some Health Facilities

4.3.6 Waste Management and Disposal of Medical Sharps

Proper disposal of sharps and management of medical waste is essential for infection control. From table 10 the findings indicate that 45 respondents (25.7%) from 14 facilities reported that sharps were burned in a protected pit, while 19 respondents (10.9%) from 5 facilities used incinerators meeting recommended temperature standards (850–1000°C). However, 19 respondents (10.9%) from 6 facilities used other types of incinerators, and 19 respondents (10.9%) from 6 facilities engaged in open burning, which poses significant health and environmental risks. 2 respondents (1.1%) from 1 facility indicated that sharps were not treated and were added to general waste, violating standard medical waste management protocols. These findings are consistent with studies by Mulogo et al. (2021), which indicated that improper healthcare waste management poses significant environmental and health risks.

Table 10: Disposal of waste

Waste Disposal	Frequency	Percent	Cumulative Percent
Autoclave	10	5.7	5.7
Other	39	22.3	28.0
Incinerator (2 chamber, 850–1000°C)	19	10.9	38.9
Incinerator (other)	19	10.9	49.7
Burning in protected pit	45	25.7	75.4
Not treated, but buried in lined, protected pit	5	2.9	78.3
Not treated, but collected for medical waste disposal	17	9.7	88.0
Open burning	19	10.9	98.9
Not treated and added to general waste	2	1.1	100.0
Total	175	100.0	

Source: Author's Field Survey, 2025



Figure 5: Picture of Bawku West District Hospital Incinerator

Source: Author's Field Survey, 2025

4.4 Comparison with WHO WASH Standards

The WHO WASH guidelines (2019) emphasize that all healthcare facilities should have continuous access to an improved water source, such as piped water, boreholes, or protected wells, to ensure patient safety and sanitation. From Table 11, the findings indicate that 7 out of 49 healthcare facilities (16.7%) lack a dedicated water source. This suggests that nearly 1 in 6 facilities operate without direct access to water, making essential hygiene practices, such as handwashing, instrument sterilization, and general facility cleaning, difficult or impossible. Among facilities with a water source, water reliability varies significantly. About 81% of facilities (34 out of 49) reported daily water availability, 6.3% of facilities (4 out of 49) reported that water was rarely available, and an additional 4.0% (3 out of 49) indicated that water was never available. This means that 7 facilities (16.7%) struggle with severe water shortages, preventing them from maintaining adequate hygiene and sanitation. The study also reveals that some facilities rely on alternative water sources.

Table 11: Assessment of health care facilities against WHO WASH standards on Water Supply, Availability and Reliability

Indicator	WHO Standard	Findings from Assessment Analysis	
Water Availability	100% of facilities should have a water source	8 out of 49 facilities (16.7%) have no water source	Does not meet WHO standard
Water Reliability (Daily Access)	Water should be available at all times	149/175 respondents (84.6%) report daily water supply in 39/49 facilities (81%)	Partially meets WHO standard
Water Interruptions	No facility should report “Rarely” or “Never”	11 respondents (6.3%) in 4 facilities report rare water supply, and 7 respondents (4.0%) in 3 facilities report no water supply	Does not meet WHO standard
Main Water Source	Should be improved (Piped, Borehole, Protected Well)	37.7% (18 facilities) use Boreholes, 33.1% (16 facilities) use Piped Water, but 11.4% (8 facilities) have no water source	Partially meets WHO standard
Alternative Sources	Water should not rely on tankers or unprotected wells	3.4% (2 facilities) rely on tanker trucks, and 0.6% (1 facility) use unprotected wells	Does not meet WHO standard

Source: Author’s construct, 2025

4.4.1 Level of WASH Services

The level of WASH services is presented in Table 12. The table presents an assessment of WASH services in healthcare facilities based on the JMP Service Ladders. While 81% of facilities (39/49) have a reliable daily water supply, 9.3% (4/49) experience occasional shortages, and 16.7% (8/49) lack a dedicated water source. 74.9% of facilities (36/49) have at least one functional toilet, but 11.4% (5/49) have only one shared toilet for staff and patients, while 25.1% (12/49) lack usable toilets entirely. The findings reveal that 84% of facilities (40/49) provide soap and water for handwashing, while 6.9% (3/49) have inadequate hygiene supplies, and 9.1% (5/49) lack soap and water altogether. Only 10.9% of facilities (5/49) follow safe disposal practices (standard incinerators), whereas 25.7% (12/49) rely on burning in protected pits, and 22.3% (11/49) use unsafe methods like open burning or mixing medical waste with general waste. Additionally, 72% of facilities (35/49) have trained cleaning staff, but 28% (13/49) lack trained personnel.

Table 12: Level of WASH Services according to the JMP WASH Service ladders

WASH Component	Basic Service (Meets standard)	Limited Service (Partially meets standard)	No Service (Does not meet standard)
Water	75.5% of facilities (37/49) have a reliable daily water supply	8.2% (4/49) experience rare water supply	8 facilities (16.3%) (8/49) have no water source
Sanitation	65.3% of facilities (32/49) have at least one functional toilet	10.2% (5/49) have only one shared toilet for staff and patients	24.5% (12/49) facilities have no usable toilets
Hygiene	81.6% of (40/49) facilities have soap and water in consultation rooms	6.1% (3/49) facilities have limited hand hygiene materials	12.2% (6/49) facilities have no soap and water

Waste Management	10.2% of facilities (5/49) follow safe disposal practices (standard incinerators)	24.5% (12/49) use burning in protected pits	65.3% (32/49) use unsafe disposal methods (open burning, adding to general waste)
Environmental Cleaning	71.4%, (35/49) of facilities have trained cleaning staff	-	28.6% (14/49) of facilities have no trained cleaning staff

Source: Author’s construct, 2025

4.5 WASH Gaps and Suggested Improvements

4.5.1 Water Availability and Reliability Gaps in Healthcare Facilities

The findings from the study reveal significant gaps in WASH infrastructure and practices across healthcare facilities in the Bawku West District. Table 13 and 14 below presents water availability and reliability gaps in the healthcare facilities.

Table 13: Water Availability Gaps

Water Availability	Respondents (N = 175)	Number of Facilities (N = 49)	Cumulative Frequency (%)	Mean Score
Available	160 (91.4%)	43	91.4	1.09
Not Available	15 (8.6%)	6	100.0	1.91
Total	175 (100%)	49	100.0%	

Source: Author’s construct, 2025

Water availability is a critical component of WASH standards. The findings indicate that 43 out of 49 facilities (87.8%) had water available at the time of the survey, while 6 facilities (12.2%) lacked access to water. The mean score of 1.09 suggests that most facilities have water access, but gaps remain. This impacts infection prevention, sanitation, and overall healthcare service delivery. The mean score of 1.91 for facilities where water was not available indicates a significant gap in

water accessibility. This higher mean score suggests that while the majority of facilities had access to water, a minority faced critical challenges in water availability. The lack of water in 6 out of 49 facilities (12.2%) has serious implications for hygiene, infection control, and service delivery, particularly in maternity and surgical wards, where water is essential for maintaining cleanliness and preventing healthcare-associated infections. This underscores the need for targeted interventions to improve water supply in the affected facilities.

4.5.2 Water Reliability Gaps in Healthcare Facilities

Water reliability is crucial for uninterrupted healthcare services. The findings indicate that 34 out of 49 facilities (69.4%) had a daily water supply, while 15 facilities (30.6%) experienced intermittent or no water supply. A mean score of 1.49 suggests that while most facilities have regular access, some face serious water shortages that affect hygiene, patient care, and sanitation measures. Water reliability significantly impacts healthcare service delivery. The mean score for weekly access (2.50) indicates intermittent water availability, which can hinder routine hygiene practices. Facilities with monthly access (3.33) experience more prolonged water shortages, affecting sanitation and patient care. A mean score of 4.09 for rare access suggests severe challenges, with facilities often lacking sufficient water for essential operations. The highest mean score, 4.71 for never having access, reflects extreme water insecurity, leading to critical hygiene and infection control issues.

Table 14: Water Reliability Gaps

Water Reliability	Respondents (N = 175)	Number of Facilities (N = 49)	Cumulative Frequency (%)	Mean Score
Daily	149 (84.6%)	34	84.6	1.49
Weekly	6 (3.4%)	3	88.0	2.50
Monthly	3 (1.7%)	2	89.7	3.33
Rarely	11 (6.3%)	4	96.0	4.09
Never	7 (4.0%)	3	100.0	4.71
Total	175 (100%)	49	100.0%	

Source: Author’s construct, 2025

4.5.3 Sanitation Gaps in Healthcare Facilities

Table 15: Identified Sanitation Gaps in Healthcare Facilities

Identified Sanitation Gap	Frequency (n = 175)	Percentage (%)	Number of Facilities (n = 49)
Inadequate toilet facilities	32	18.3	12
Lack of gender-segregated toilets	25	14.3	9
Absence of menstrual hygiene facilities	40	22.9	14
Lack of handwashing facilities near toilets	26	14.9	10
Soap and water not always available	19	10.9	8
Total	175	100.0	49

Source: Author's construct, 2025

From Table. 15 above, inadequate toilet facilities were reported by 32 respondents (18.3%) across 12 out of 49 facilities (24.5%), highlighting a pressing need for improved sanitation infrastructure. Additionally, 25 respondents (14.3%) from 9 facilities (18.4%) reported a lack of gender-segregated toilets, which may contribute to discomfort and hygiene challenges, particularly for female patients and staff. The absence of menstrual hygiene facilities was noted by 40 respondents (22.9%) across 14 facilities (28.6%), indicating a gap in gender-responsive WASH interventions. Similarly, 26 respondents (14.9%) from 10 facilities (20.4%) identified a lack of handwashing facilities near toilets, which undermines infection prevention efforts. The KII provided further insights into these challenges, with key informant expressing concerns about the dire state of sanitation in their facilities.

One facility manager highlighted the issue of inadequate toilet facilities, stating:

“We have only one toilet for both staff and patients, and it is often in a very bad state. Sometimes, patients prefer to go outside rather than use the facility because of the odor and unhygienic conditions” (Facility Manager, Naaba Akparibilla Medical Centre, 2025).

Furthermore, 19 respondents (10.9%) across 8 facilities (16.3%) noted that soap and water were not always available, further compromising basic hygiene practices. These findings indicate significant gaps in sanitation provisions, necessitating targeted interventions to enhance hygiene standards, reduce health risks, and improve overall healthcare service delivery.

4.5.4 Waste Management Gaps in Healthcare Facilities

Table 16: Identified Waste Management Gaps in Healthcare Facilities

Waste Disposal Method	Respondents (N = 175)	Number of Facilities (N = 49)	Cumulative Frequency (%)
Incinerator (850–1000°C)	19 (10.9%)	8	10.9
Burning in protected pit	45 (25.7%)	11	36.6
Open burning	19 (10.9%)	6	47.5
Autoclave	10 (5.7%)	5	53.2
Not treated (buried)	5 (2.9%)	3	56.1
Collected for disposal	17 (9.7%)	6	65.8
Not treated (added to general waste)	2 (1.1%)	2	66.9
Other	39 (22.3%)	7	100.0
Total	175 (100%)	49	100.0%

Source: Author’s field survey, 2025

High-Risk Waste Disposal Practices

The findings indicate that only 8 out of 49 healthcare facilities (10.9 %) use high-temperature incineration (850–1000°C), which is the gold standard for medical waste disposal. However, 19 respondents (10.9%) practiced open burning, showing that access to proper incineration facilities remains limited in the district. These findings support the work of Künzli et al. (2020), which

emphasized that inadequate sharps disposal mechanisms significantly increase occupational hazards for healthcare workers.

A significant proportion (45 respondents, 25.7%) from 11 facilities (24.5%) rely on burning in protected pits. While this method reduces volume, it still releases pollutants and is not a long-term sustainable practice. One nurse expressed concern;

“We have no proper incinerator, so sometimes we have to burn waste in open pits. This is not safe, and it exposes both staff and the surrounding community to health hazards” (Nurse, Zebilla S.H.S, 2025).

Additionally, 5 out of 49 facilities (10.2%) utilize autoclaves, a more controlled sterilization method, as reported by 10 respondents (5.7%). While autoclaving is effective, it requires a proper disposal system after sterilization. 5 facilities (6.1%) rely on the burial of medical waste, while 6 facilities (12.2%) only collect waste for later disposal. More critically, 2 facilities (4.1%) were reported to add untreated medical waste to general waste streams, highlighting a serious infection risk to staff, patients, and the environment.

Inconsistencies in Waste Management

A large proportion of facilities (7 out of 49, 14.3%) reported using other disposal methods, as indicated by 39 respondents (22.3%). The lack of standardization suggests inconsistent waste management policies, increasing risks of contamination and exposure to hazardous materials.

4.5.5 Training Gaps

Adequate training in hygiene and infection prevention is crucial for maintaining high WASH standards in healthcare facilities. However, findings indicate that many healthcare workers and support staff lack essential training, limiting their ability to implement effective hygiene practices.

Table 17: Training on Hygiene Practices Gaps in Healthcare Facilities

Training Gap	Frequency (n = 175)	Percentage (%)	Number of Facilities (n = 49)
Inadequate training on WASH practices	47	26.9	15
Lack of training for healthcare cleaners	42	24.0	12
Lack of refresher training on hygiene and infection prevention	41	23.4	13
Other training gaps	45	25.7	13
Total	175	100.0	49

Source: Author's Construct, 2025

Table 17 shows that training gaps were prevalent across all 49 healthcare facilities surveyed. A total of 47 respondents (26.9%) indicated that inadequate training on WASH practices was a challenge in 15 facilities (31.3%), which could lead to poor hygiene behaviors and non-compliance with infection prevention protocols.

Additionally, 42 respondents (24.0%) reported that 12 out of 49 facilities (25.0%) lacked specific training for healthcare cleaners. Given their role in maintaining cleanliness in healthcare settings, this gap could contribute to improper sanitation practices and increased risks of cross-contamination.

Furthermore, 41 respondents (23.4%) highlighted those 13 facilities (27.1%) had no refresher training programs for healthcare workers on infection control and hygiene. This lack of continuous training may hinder effective infection prevention efforts and adherence to safety protocols. A senior nurse emphasized the impact of this gap, stating;

“Most of the staff, especially the cleaners, do not have proper training on infection control. They clean the wards, but they don’t always follow the right procedures, which increases the risk of infections.” (Senior nurse, Timonde health Centre, 2025).

Lastly, 45 respondents (25.7%) identified other training gaps affecting 13 facilities (27.1%), suggesting a broader need for comprehensive and ongoing capacity-building programs in healthcare settings.

4.5.6 WASH Gaps and Areas for Improvement in Healthcare Facilities

Table 18: Summary of WASH Gaps and Areas for Improvement in Healthcare Facilities

WASH Gap Identified	Frequency (n=175)	Percentage (%)	Number of Facilities (n=49)	Suggested Areas for Improvement	Respondent Feedback
Facilities lacking a dedicated water source	15	8.6%	6	Install boreholes or connect to a reliable piped water system	15 respondents (8.6%) from 6 facilities suggested installing boreholes or connecting facilities to a reliable piped water system.
Unreliable water access (rarely or never available)	18	10.3%	7	Install water storage systems such as reservoirs/tanks	18 respondents (10.3%) from 7 facilities recommended

					installing water storage tanks to ensure water availability during interruptions.
Use of unsafe water sources (tanker trucks, unprotected wells)	7	4.0%	3	Invest in sustainable, improved water infrastructure	7 respondents (4.0%) from 3 facilities suggested transitioning from tanker trucks and unprotected wells to boreholes or piped water.
Lack of functional toilets for staff and patients	44	25.1%	12	Construct additional gender-segregated toilets	44 respondents (25.1%) from 12 facilities emphasized the need for new and separate toilets for staff and patients.
Inadequate menstrual	67	38.3%	14	Provide sanitary bins	67 respondents

hygiene facilities in female toilets				and hygiene products	(38.3%) from 14 facilities called for sanitary bins and menstrual hygiene products in female toilets.
Absence of functional handwashing stations near toilets	57	32.6%	13	Install handwashing stations near all toilets and ensure availability of soap and water	57 respondents (32.6%) from 13 facilities identified the need for dedicated handwashing stations.
Lack of soap and handwashing materials in consultation rooms	28	16.0%	8	Ensure regular supply of soap and alcohol-based hand rubs	28 respondents (16.0%) from 8 facilities suggested providing soap and hand sanitizers for proper infection control.
Unsafe waste disposal	64	36.6%	17	Provide incinerators	64 respondents

(open burning, shallow pits, no incineration)				and enforce safe waste disposal protocols	(36.6%) from 17 facilities advocated for the installation of incinerators and proper waste disposal sites.
Inadequate sharps disposal systems	17	9.7%	6	Supply sharps disposal containers and implement training on safe disposal	17 respondents (9.7%) from 6 facilities highlighted the need for proper sharps disposal units.
Lack of regular training for healthcare staff on hygiene practices	77	44.0%	19	Conduct regular training on infection prevention and control	77 respondents (44.0%) from 19 facilities recommended periodic refresher training for healthcare staff.
Facility cleaners have never	49	28.0%	12	Provide structured training	49 respondents (28.0%) from

received hygiene training				programs for facility cleaners	12 facilities requested formal hygiene training for facility cleaners.
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Source: Author’s construct, 2025

Water Access and Reliability Improvements

Table 18, above shows that, 6 facilities (8.6%) lack a dedicated water source, with 8.6% of respondents recommending urgent interventions such as borehole installations or connections to piped water systems to ensure a reliable water supply. 7 facilities (10.3%) experience unreliable water access (rarely or never available), with 10.3% of respondents suggesting the installation of water storage solutions, including reservoirs or tanks, to mitigate supply interruptions.

Also, 3 facilities (4.0%) rely on unsafe water sources such as tanker trucks and unprotected wells, with 4.0% of respondents advocating for investment in sustainable water infrastructure to reduce dependence on unreliable and unsafe sources. Similar findings by WHO & UNICEF (2021) suggest that increasing access to sustainable water infrastructure improves overall healthcare service delivery. This finding is also consistent with a study by Cronk and Bartram (2018), which found that healthcare facilities in low-resource settings often lack access to reliable water sources, undermining infection prevention measures.

Sanitation and Hygiene Enhancements

The findings also reveal that 12 facilities (25.1%) lack adequate toilet facilities, with 25.1% of respondents calling for the construction of additional gender-segregated toilets to ensure privacy and improved sanitation for both staff and patients. Furthermore, 14 facilities (38.3%) lack menstrual hygiene facilities, and 38.3% of respondents suggested installing sanitary bins and providing menstrual hygiene products to promote dignity and comfort for female staff and patients. Findings also reveal that 13 facilities (32.6%) do not have functional handwashing stations near toilets, and 32.6% of respondents emphasized the need to install handwashing stations and ensure

continuous availability of soap and water to improve hygiene and infection prevention, with 8 facilities (16.0%) lacking soap and handwashing materials in consultation rooms, with 16.0% of respondents recommending a consistent supply of soap and alcohol-based hand rubs to support effective hand hygiene practices.

Waste Management and Training Interventions

The findings reveal that, 17 facilities (36.6%) lack proper waste disposal systems, and 36.6% of respondents advocated for the installation of incinerators and the enforcement of safe waste disposal protocols to prevent environmental hazards. 6 facilities (9.7%) lack proper sharps disposal systems, and 9.7% of respondents recommended providing sharps disposal containers and training healthcare workers on safe handling to prevent injuries and infections. Also, 19 facilities (44.0%) have staff who have not received regular hygiene training, with 44.0% of respondents emphasizing the need for periodic refresher courses on infection prevention and control to improve adherence to hygiene standards. Furthermore, 12 facilities (28.0%) have untrained cleaners, and 28.0% of respondents suggested structured training programs for facility cleaners to enhance sanitation and cleanliness within healthcare environments. Similarly, research by WaterAid (2020) emphasizes the importance of training healthcare workers to ensure compliance with hygiene protocols. Similar findings were also reported by Pires et al. (2019), who emphasized that continuous training of healthcare workers is essential for improving compliance with hygiene protocols

4.6 Key Challenges and Opportunities for Improving WASH Standards in Healthcare Facilities

4.6.1: Key Challenges in WASH Implementation in Healthcare Facilities

Water Access Issues

The findings in Table 19 below indicate that 6 out of 49 facilities (8.6%) lack a dedicated water source, making it difficult to maintain hygiene and infection control. Furthermore, 7 facilities (10.3%) reported unreliable water supply, with respondents indicating that water was rarely or never available. A significant concern is that 3 facilities (4.0%) still depend on unsafe water sources, such as tanker trucks and unprotected wells, which pose contamination risks. These

challenges mirror findings by WHO and UNICEF (2021), which reported that water insecurity in healthcare facilities in Sub-Saharan Africa significantly compromises patient safety and service delivery.

One key informant highlighted the unreliable water supply, stating that:

“we rely on boreholes and poly tanks, but sometimes there is no water, especially when there is a power outage. It affects our ability to maintain hygiene” (Senior nurse, Timonde Health Centre, 2025).

Another respondent noted the inadequate water storage, saying, *“our overhead tanks are too small, so we have to keep refilling them. It is difficult to ensure a constant water supply throughout the day” (Sub-district Head, Timonde Health Center).*

A healthcare worker also raised concerns about water quality testing, mentioning that *“even though we have a WASH action plan, we hardly test the water to know if it is safe.” (Nurse In charge, Zebilla Town Clinic, 2025).*

Sanitation Challenges

Sanitation inadequacies remain a pressing concern. The findings reveal that 12 facilities (25.1%) do not have enough toilets, resulting in overcrowding and potential hygiene risks. Additionally, 8 facilities (14.3%) lack gender-segregated toilets, which can discourage usage, particularly among female staff and patients. The absence of menstrual hygiene facilities in 12 facilities (22.9%) further exacerbates sanitation issues, making it difficult for female patients and staff to manage their hygiene effectively. Poor sanitation facilities were a major concern, with one respondent stating, *“our toilets are not well maintained, and sometimes community members also use them, making the situation worse.” (Facility manager, Timonde health Centre, 2025).*

Menstrual hygiene was also highlighted as a challenge, with a key informant explaining, *“there are no sanitary pads provided for female patients, and disposal bins are also not available in the washrooms.” (Nurse, Yarigu Health Center).* Studies by Sommer et al. (2015) emphasized the importance of gender-responsive sanitation infrastructure in healthcare settings to promote dignity

and ensure equitable access to facilities. This finding also aligns with research by WaterAid (2020), which highlights that inadequate menstrual hygiene facilities in healthcare settings disproportionately affect women and contribute to absenteeism among female health workers.

Another added, *“we don’t have accessible toilets for persons with disabilities, which makes it difficult for some patients to use the facility comfortably.”* (Nurse, Kobogo CHPS,2025)

One informant reported, *“the septic tank gets full frequently, and when it blocks, the whole place smells bad, making it unhygienic for patients and staff.”* (Nurse, Timonde health center,2025).

This aligns with Hutton and Chase (2016), who found that inadequate sanitation facilities contribute to increased health risks and reduce healthcare efficiency

Hygiene Challenges

Hand hygiene is a fundamental component of infection prevention, yet 13 facilities (32.6%) lack functional handwashing stations near toilets. This is a critical gap, as it increases the risk of disease transmission. This supports previous research by Freeman et al. (2017), which found that the absence of hand hygiene facilities in healthcare settings leads to higher rates of healthcare-associated infections. Furthermore, 8 facilities (16.0%) reported inconsistent availability of soap and water in consultation rooms, indicating a need for regular supply monitoring. Similar challenges were reported in a study by Pires et al. (2019), which emphasized that the inconsistent availability of hygiene supplies compromises infection prevention and control measures.

Handwashing facilities were a challenge, with a key informant noting, *“we have handwashing stations, but they are not enough, and some of the sinks are broken, so we are forced to share one.”* (WASH Focal Person, the Zebilla North Sub-district, 2025).

Another respondent explained that *“even though we educate patients on hygiene, some do not comply. They don’t wash their hands, and it affects infection prevention.”* (WASH Focal Person, Zebilla S.H.S Clinic,2025).

Waste Management Issues

Proper waste disposal is essential in preventing healthcare-associated infections. However, 17 facilities (36.6%) still engage in unsafe waste disposal methods, including open burning and the use of shallow pits. Additionally, 6 facilities (9.7%) reported a lack of proper sharps disposal

systems, increasing the risk of needle-stick injuries and disease transmission. This is consistent with findings by Mulogo et al. (2021), who noted that poor medical waste management practices in low-income settings contribute to environmental contamination and the spread of infectious diseases

A health worker pointed out, *“we don’t have different colored bins for waste segregation, so all waste is mixed, which is not safe.”* (Nurse In-charge, Zebilla Town Clinic, 2025).

The lack of proper disposal methods was also emphasized, with one respondent stating, *“we don’t have an incinerator for burning sharps, so we store them for a long time before disposal.”* (WASH focal person, Kobogo CHPS, 2025).

Another informant mentioned, *“we burn infectious waste in open pits, but the pits are not deep enough, so it is not safe.”* (Health worker, Yarigu Health Center, 2025).

Institutional Challenges

Training and capacity building are crucial for maintaining high WASH standards. Alarming, 19 facilities (44.0%) reported that healthcare staff do not receive regular training on hygiene and infection prevention. Additionally, 12 facilities (28.0%) indicated that facility cleaners had never received formal hygiene training, which raises concerns about the effectiveness of cleaning and disinfection procedures. One administrator lamented the financial limitations, saying, *“there is no dedicated budget for WASH improvements, so we struggle to maintain the facilities.”* (Health Promotion Officer and WASH Focal Person, District Health Directorate, 2015)

Another key informant added, *“funding from the government is not enough, and this affects infrastructure repairs and WASH training programs.”* (Sub-District Head, Tanga Timonde, 2025)

Regarding training, a respondent stated, *“our staff hardly receive external WASH training, which affects their knowledge and compliance with hygiene protocols.”* (Health Promotion Officer and WASH Focal Person, District Health Directorate, 2025)

Table 19: Key Challenges in WASH Implementation in Healthcare Facilities

Identified Challenge	Frequency (n=175)	Percentage (%)	Number of Facilities (n=49)	Cumulative Percentage (%)
Water Access Issues				
Facilities lacking a dedicated water source	15	8.6%	6	8.6%
Unreliable water supply (rarely or never available)	18	10.3%	7	18.9%
Dependence on unsafe sources (tankers/unprotected wells)	7	4.0%	3	22.9%
Sanitation Challenges				
Inadequate number of toilets	44	25.1%	12	49.0%
Lack of gender-segregated toilets	25	14.3%	8	62.3%
Absence of menstrual hygiene facilities	40	22.9%	12	85.1%
Hygiene Challenges				
Absence of functional handwashing stations	57	32.6%	13	63.7%
Soap and water not always available in consultation rooms	28	16.0%	8	79.7%

Waste Management Issues				
Unsafe waste disposal (open burning, shallow pits, no incineration)	64	36.6%	17	96.3%
Inadequate sharps disposal systems	17	9.7%	6	100.0%
Institutional Challenges				
Lack of regular training for healthcare staff	77	44.0%	19	82.0%
Facility cleaners have never received hygiene training	49	28.0%	12	100.0%

Source: Author’s construct, 2025

4.6.2 Opportunities for Improving WASH Standards in Healthcare Facilities

Table 20: Opportunities for Improving WASH Standards in Healthcare Facilities

Opportunity for Improvement	Frequency (n=175)	Percentage (%)	Number of Facilities (n=49)	Suggested Interventions
Installation of boreholes or reliable piped water	15	8.6%	6	Expand water infrastructure, connect facilities to municipal supply
Provision of water storage tanks	18	10.3%	7	Ensure continuous water supply by

				installing reservoirs/tanks
Construction of additional functional toilets	44	25.1%	12	Increase access to gender-segregated toilets for staff and patients
Provision of menstrual hygiene facilities	67	38.3%	14	Supply sanitary bins and hygiene products in female toilets
Installation of handwashing stations near toilets	57	32.6%	13	Set up handwashing facilities and ensure soap and water availability
Provision of soap and handwashing materials in consultation rooms	28	16.0%	8	Regular supply of soap, alcohol-based hand rubs, and sanitizers
Installation of incinerators and improved waste disposal systems	64	36.6%	17	Establish proper incinerators and regulated waste disposal sites
Introduction of sharps disposal containers and training	17	9.7%	6	Distribute sharps disposal bins and train staff on proper handling
Regular staff training on infection prevention	77	44.0%	19	Organize periodic refresher training for healthcare staff

Training for facility cleaners on hygiene practices	49	28.0%	12	Develop structured training programs for facility cleaners
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Source: Author’s construct, 2025

From Table 20 for water supply improvements, six (12.2%) of the 49 facilities lack a dedicated water source, leading to disruptions in service delivery. To address this, 8.6% of respondents suggested installing boreholes or connecting facilities to reliable piped water. Additionally, 10.3% of respondents from seven facilities advocated for the provision of water storage tanks to ensure water availability during shortages. One key informant suggested, *“if we get bigger overhead tanks and durable pipes, we can store enough water and avoid shortages.”* (Sub-District Head, Tanga Timonde,2025)

Another added, *“providing new handwashing stations and repairing broken sinks will improve hygiene practices.”* (WASH Focal Person, Tanga Timonde Sub-district,2025).

A respondent also noted the need for better toilets, stating, *“if accessible toilets are built, it will help persons with disabilities use the facilities more easily.”* (Health Promotion Officer and WASH Focal Person, District Health Directorate,2025).

Sanitation Enhancements

The most frequently cited opportunity was the need for improved menstrual hygiene facilities (38.3%), with respondents from 14 facilities emphasizing the provision of sanitary bins and hygiene products in female toilets. Similarly, 25.1% of respondents from 12 facilities called for the construction of additional functional toilets to accommodate both staff and patients. Studies by Hutton & Chase (2016) indicate that improved sanitation facilities lead to better patient outcomes and reduced disease transmission in healthcare settings. Sommer et al. (2015) argue that investing in gender-sensitive sanitation infrastructure in healthcare facilities improves accessibility and dignity, particularly for women.

Hygiene Interventions

The absence of proper handwashing stations near toilets was noted in 13 facilities (32.6%), with respondents recommending the installation of washing facilities along with a consistent supply of

soap and water. Additionally, 16.0% of respondents identified the need for soap and sanitizers in consultation rooms, particularly for infection prevention and control. According to Cronk & Bartram (2018), the absence of adequate hand hygiene facilities increases the risk of healthcare-associated infections. Previous studies by Freeman et al. (2017) have also highlighted the role of hand hygiene in preventing the spread of infections.

Waste Management Solutions

Unsafe waste disposal remains a significant concern, with 36.6% of respondents across 17 facilities advocating for the installation of incinerators and structured waste disposal methods. Furthermore, 9.7% of respondents identified the lack of sharps disposal containers, emphasizing the need for proper biomedical waste management. One respondent proposed, *“we need an incinerator for sharps and infectious waste to avoid long storage periods.”* (Health Promotion Officer and WASH Focal Person, District Health Directorate, 2025).

Another key informant suggested, *“introducing color-coded bins will help in proper waste segregation.”* (WASH Focal Person, Yarigu CHPS, 2025).

Künzli et al. (2020) suggest that integrating proper medical waste disposal systems, such as incinerators and secure sharps disposal bins, improves environmental safety and reduces occupational hazards.

Capacity Building & Training

A substantial proportion (44.0%) of respondents across 19 facilities highlighted the importance of staff training on infection prevention and hygiene practices. Additionally, 28.0% of respondents indicated the need for training facility cleaners to ensure proper sanitation and environmental hygiene management. A key informant emphasized, *“more frequent training on hygiene and WASH standards will help improve compliance among staff.”* (Health Promotion Officer and WASH Focal Person, District Health Directorate, 2025).

Another suggested, *“community sensitization programs should be strengthened so that patients and visitors also maintain good hygiene practices.”* (WASH Focal Person, Tanga Timonde Sub-district, 2025).

Research by Pires et al. (2019) supports this, indicating that continuous capacity-building programs improve adherence to hygiene protocols.

CHAPTER FIVE SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

5.1 Introduction

The study sought to assess the Water, Sanitation, and Hygiene (WASH) Standards in Healthcare Facilities in Bawku West District, Ghana. The key findings are summarized below.

5.2 Summary of Major findings

The findings in this study were guided by 3 major objectives, namely:

1. Assess the current WASH standards in healthcare facilities in Bawku West District.
2. Identify gaps and areas for improvement of WASH in healthcare facilities in Bawku West District.
3. Analyze the key challenges and opportunities for improving WASH standards in healthcare facilities in the Bawku West District.

5.2.1 Assessment of WASH Standards in Healthcare Facilities

Water Availability and Reliability: While 91.4% of respondents (160) reported that water was available from the main supply at the time of the survey, 15 respondents (8.6%) from six facilities indicated unavailability, highlighting a gap in water security. Additionally, 10.3% of respondents from seven facilities reported unreliable water access, and 4.0% from three facilities relied on unsafe sources such as tanker trucks and unprotected wells.

Sanitation Facilities: 25.1% of respondents from 12 facilities reported inadequate toilet facilities, and 38.3% from 14 facilities cited the lack of menstrual hygiene facilities, emphasizing the need for gender-responsive sanitation improvements.

Hand Hygiene and Infection Control: 32.6% of respondents from 13 facilities reported an absence of functional handwashing stations near toilets, and 16.0% from eight facilities noted the lack of soap and sanitizers in consultation rooms.

Waste Management: Unsafe disposal practices were reported in 17 facilities, with 36.6% of respondents highlighting open burning and shallow pits as waste disposal methods.

Training and Capacity Building: 44.0% of respondents from 19 facilities lacked regular training on hygiene practices, and 28.0% from 12 facilities reported that facility cleaners had never received formal hygiene training.

5.2.2 Identified Gaps and Areas for Improvement

Water Supply Enhancements: Six (12.2%) of the 49 facilities lack a dedicated water source, and 10.3% of respondents from seven facilities recommended installing water storage tanks to ensure water availability.

Sanitation Improvements: 38.3% of respondents from 14 facilities emphasized the need for menstrual hygiene facilities, while 25.1% from 12 facilities called for additional toilets.

Hygiene Interventions: 32.6% of respondents from 13 facilities recommended installing handwashing stations and ensuring the availability of soap and water.

Waste Management Solutions: 36.6% of respondents from 17 facilities advocated for the installation of incinerators and structured waste disposal methods.

Training and Awareness: 44.0% of respondents from 19 facilities emphasized the importance of staff training on infection prevention, while 28.0% of respondents recommended hygiene training for facility cleaners.

5.2.3 Key Challenges and Opportunities for Improving WASH Standards

The study identified several key challenges affecting the implementation and maintenance of WASH standards in healthcare facilities in the Bawku West District. These challenges align with findings from previous studies, which highlight systemic issues related to water access, sanitation, hygiene, waste management, and institutional capacity. However, the study also identified opportunities for improvement, including infrastructure development, community engagement,

and capacity-building initiatives, which are supported by existing literature on WASH interventions in healthcare settings.

A major challenge identified in this study was water access issues, as six out of 49 healthcare facilities (8.6%) lacked a dedicated water source, making it difficult to maintain proper hygiene and infection control. Furthermore, seven facilities (10.3%) reported unreliable water supply, with respondents indicating that water was rarely or never available. Additionally, three facilities (4.0%) depended on unsafe water sources, such as tanker trucks and unprotected wells, posing contamination risks.

Sanitation challenges were also prevalent, with 12 facilities (25.1%) lacking adequate toilets, resulting in overcrowding and unsanitary conditions. Additionally, eight facilities (14.3%) did not have gender-segregated toilets, which can discourage usage, particularly among female staff and patients. The absence of menstrual hygiene facilities in 12 facilities (22.9%) further exacerbates sanitation issues, making it difficult for female patients and staff to manage their hygiene effectively.

Hygiene challenges further exacerbate the WASH issues in healthcare facilities. The study found that 13 facilities (32.6%) lacked functional handwashing stations near toilets, limiting access to proper hand hygiene and increasing the risk of disease transmission. Furthermore, eight facilities (16.0%) reported inconsistent availability of soap and water in consultation rooms, indicating a need for regular supply monitoring.

Another major concern was waste management issues, which present significant health risks in healthcare settings. The study revealed that 17 facilities (36.6%) engaged in unsafe waste disposal methods, including open burning and shallow pits, which pose serious environmental and public health risks. Additionally, six facilities (9.7%) reported a lack of proper sharps disposal systems, increasing the risk of needle-stick injuries and disease transmission.

Institutional challenges related to training and capacity building were also evident in the study. The findings indicated that 19 facilities (44.0%) lacked regular training programs for healthcare staff on hygiene and infection prevention, reducing their ability to maintain high WASH standards. Additionally, 12 facilities (28.0%) reported that facility cleaners had never received formal hygiene training, raising concerns about the effectiveness of cleaning and disinfection procedures.

Research by WaterAid (2020) has similarly highlighted that the absence of structured hygiene training for healthcare facility cleaners contributes to poor sanitation and infection control outcomes.

Despite these challenges, the study also identified several opportunities for improving WASH standards in healthcare facilities. Infrastructure development was highlighted as a critical area for intervention. The study found that six facilities (8.6%) required boreholes or connections to a reliable piped water system, while seven facilities (10.3%) needed water storage tanks to ensure a continuous supply. Expanding water infrastructure and ensuring consistent water availability would significantly enhance hygiene and infection control measures.

Sanitation improvements were also emphasized as a key opportunity. Respondents from 14 facilities (38.3%) recommended the provision of menstrual hygiene facilities, including sanitary bins and hygiene products, to address the needs of female staff and patients. Additionally, 12 facilities (25.1%) called for the construction of additional functional toilets, particularly gender-segregated toilets for staff and patients.

The study also identified hygiene interventions as a crucial opportunity for WASH improvements. Respondents from 13 facilities (32.6%) recommended installing handwashing stations near toilets and ensuring a consistent supply of soap and water. Additionally, eight facilities (16.0%) emphasized the need for soap and sanitizers in consultation rooms to enhance infection prevention measures.

Waste management solutions were another key opportunity identified in the study. Seventeen facilities (36.6%) advocated for the installation of incinerators and structured waste disposal methods, while six facilities (9.7%) emphasized the need for proper sharps disposal containers. Establishing regulated waste disposal systems would help minimize health risks associated with improper waste handling.

Finally, capacity-building initiatives were highlighted as an essential strategy for improving WASH standards. The study found that 19 facilities (44.0%) emphasized the need for regular training on infection prevention for healthcare staff, while 12 facilities (28.0%) called for structured hygiene training programs for facility cleaners. Investing in training and capacity-building initiatives would equip healthcare workers and cleaners with the necessary skills to

maintain proper hygiene and sanitation standards, ultimately improving healthcare service delivery.

In summary, while healthcare facilities in the Bawku West District face significant WASH challenges, the study highlights multiple opportunities for improvement. Addressing water supply issues, enhancing sanitation and hygiene facilities, implementing structured waste management systems, and strengthening training programs can significantly improve WASH compliance in healthcare settings. These findings align with global recommendations by WHO and UNICEF (2021), which emphasize that sustainable improvements in WASH infrastructure and training are essential for achieving high-quality healthcare service delivery.

5.3 Conclusion

The study highlights WASH standards in healthcare facilities in the Bawku West District, emphasizing the need for strategic interventions in water supply, sanitation, hygiene, waste management, and training. Addressing these gaps requires collaborative efforts between government agencies, healthcare institutions, and community stakeholders. By implementing the recommended improvements, healthcare facilities can enhance infection prevention, improve service delivery, and contribute to better public health outcomes.

5.4 Recommendations

Consistent with the findings and conclusions of this study, the following recommendations are proffered to improve WASH standards in healthcare facilities in the study area.

First, the findings of this study indicate a need for targeted interventions to improve WASH standards in healthcare facilities in the Bawku West District. The District Health Directorate, in collaboration with the Ministry of Health in addressing these gaps requires strategic infrastructure development, effective waste management, capacity building, policy enforcement, and stakeholder engagement.

Secondly, infrastructure improvements should focus on increasing access to sustainable water sources. For instance, the District Health Directorate, in collaboration with the Ministry of Health

and relevant NGOs, should oversee the installation of boreholes or connections to reliable piped water systems.

Additionally, to maintain sanitation standards, healthcare facility management, with support from the District Assemblies, should prioritize the construction of gender-segregated toilets and ensure the availability of menstrual hygiene facilities.

Furthermore, to improve hand hygiene, healthcare facilities, supported by the Ghana Health Service, should ensure the installation of functional handwashing stations and a continuous supply of soap and water.

Additionally, the study recommends several waste management improvements to mitigate the risks associated with improper disposal of medical waste. The Ministry of Health should allocate resources for providing incinerators and enforcing safe waste disposal protocols across all healthcare facilities in the district.

Furthermore, healthcare facilities, with guidance from the Environmental Protection Agency, should be equipped with designated sharps disposal containers to reduce the risk of infection and contamination.

The study also recommends that waste management improvements are necessary to mitigate the risks associated with improper disposal of medical waste. The Ministry of Health should be responsible for providing incinerators and enforcing safe waste disposal protocols to significantly enhance waste management practices across healthcare facilities in the Bawku West District.

Furthermore, healthcare facilities, with guidance and oversight from the Environmental Protection Agency (EPA), should be responsible for ensuring that they are equipped with designated sharps disposal containers to reduce the risk of infection and contamination. The study recommends that training and capacity building are fundamental in ensuring adherence to hygiene and sanitation standards.

The District Health Directorate, in collaboration with the Ghana Health Service and relevant NGOs, should be responsible for organizing and conducting regular training sessions for

healthcare workers and facility cleaners on infection prevention and best practices in WASH management.

It is also recommended that policy strengthening and enforcement are critical in maintaining WASH standards. The primary responsibility for these actions should lie with the District Health Directorate, in collaboration with the Ghana Health Service and the Ministry of Health. To achieve this, several actions are necessary. First, existing national and district-level WASH policies related to healthcare facilities should be reviewed and updated. This process, involving the District Health Directorate, Ghana Health Service, and the Ministry of Health, should ensure policies reflect current best practices, address identified gaps (e.g., specific standards for accessibility, waste segregation, and infection prevention), and align with national health strategies. The estimated cost for this review and update, primarily involving personnel time, stakeholder meetings, and document preparation, could range from GHS 10,000 to GHS 50,000, depending on the extent of the review and stakeholder involvement, with an estimated timeframe of 6 to 12 months.

Furthermore, a detailed district-wide WASH policy implementation plan should be developed by the District Health Directorate in collaboration with relevant stakeholders such as Environmental Health Officers and facility managers. This plan should outline clear roles and responsibilities for different actors, establish specific targets and indicators for WASH improvements, include a monitoring and evaluation framework, and provide a budget for implementation. The estimated cost for developing this plan could range from GHS 15,000 to GHS 75,000, depending on the complexity of the plan and stakeholder engagement, with an estimated timeframe of 6 to 9 months.

In addition, the District Health Directorate and the Ghana Health Service should strengthen monitoring and evaluation systems to track compliance with WASH policies in healthcare facilities. This includes regular inspections of facilities, data collection on WASH indicators, and the establishment of feedback mechanisms for facilities to address non-compliance. The estimated cost for ongoing implementation of these systems, including personnel time, data collection tools, and potentially software for data management, could range from GHS 20,000 to GHS 100,000 per year, with initial system strengthening within 12 to 18 months.

The District Health Directorate and Environmental Health Officers, in collaboration with facility management, should enforce compliance with WASH policies. This may involve providing support and guidance to facilities to improve their WASH practices, issuing warnings or sanctions for non-compliance (as outlined in the policies), and publicly recognizing facilities that demonstrate good WASH practices. The costs associated with these enforcement actions are primarily related to personnel time for inspections, enforcement activities, and follow-up, and are included within the costs outlined for the monitoring and evaluation systems. It is important to note that the costs and timeframes provided are estimates, and a detailed budget should be developed based on the specific context, available resources, and the level of intervention required. Effective implementation will also require strong collaboration among all stakeholders and a phased approach may be necessary.

Stakeholder engagement and funding play a crucial role in sustaining WASH improvements. Increased government and donor support is necessary to fund infrastructure development, training programs, and waste management interventions. The study recommends that public-private partnerships should be fostered to ensure long-term sustainability and resource mobilization for WASH initiatives.

5.5 Suggestions for Further Research

Future research should explore:

- The long-term impact of WASH interventions on healthcare delivery in the Bawku West District
- Comparative studies between urban and rural healthcare facilities in Ghana.
- The role of community engagement in sustaining WASH improvements in healthcare settings.

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CHAPTER SEVEN
APPENDIX

7.1 Ethical Approval Letter

OUR CORE VALUES

- People-Centered
- Professionalism
- Teamwork
- Innovation
- Discipline
- Integrity

Ref: GHS/UER/ORD/RES/G-6
My Ref. No:001111



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**PAN AFRICAN UNIVERSITY-INSTITUTE FOR
WATER & ENERGY SCIENCES (PAUWES)**

Dear Rahama Alhassan,

RE: INTRODUCTION LETTER FOR ETHICAL CLEARANCE APPROVAL LETTER.

This letter serves to formally acknowledge the receipt of your correspondence dated December 27, 2024, which was submitted by your head of department. The letter articulates a request for permission to undertake the study titled "*Assessment of Water, Sanitation, and Hygiene (WAS) Standards in Health Care Facilities in the Bawku West District.*"

We are pleased to inform you that your request for this important research initiative has been approved. The significance of examining WAS standards within healthcare facilities cannot be overstated, as it directly correlates with the health outcomes of the communities served. Consequently, this study is anticipated to yield valuable insights into current practices and areas for improvement in health service delivery.

Before you commence your research, we kindly request that you submit a copy of Ethical Clearance to my office. This step is critical in ensuring that the study adheres to the ethical guidelines necessary for research involving human subjects and health-related data.

We look forward to the commencement of your studies and are confident that the findings will contribute meaningfully to the enhancement of water, sanitation, and hygiene standards within the healthcare system in the Bawku West District.

Thank you.

DR. (Med.) SAMUEL K. BOAKYE-BOATENG.
REGIONAL DIRECTOR OF HEALTH SERVICES (UER).

Cc: The Regional Research officer UER.

7.2 Core questions and indicators developed by the WHO/UNICEF JMP for evaluating WASH in HCFs

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1. Main water source (select one): Piped Tube well/Borehole Protected dug well
 Unprotected dug well Protected spring Unprotected spring Rain water
 Tanker truck Surface water (River/Lake/Canal) No water source Other:_____
 2. Main water source is on premises: Yes Off premises but up to 500 m More than 500 m
 3. Water from main source is currently available: Yes No
 4. Number of usable (available, functional, private) toilets for health care facility: _____ (insert number)
 5. Type of toilets/latrines (select one – most common): Flush/Pour-flush to sewer
 Flush/Pour-flush to tank or pit Flush/Pour-flush to open drain Pit latrine with slab/covered
 Pit latrine without slab/open Bucket Hanging toilet/latrine None
 6. Toilets separated for staff and patients: Yes No
 7. Toilets separated for male and female patients: Yes No
 8. Female toilets have facilities to manage menstrual hygiene needs (covered bin, and/or water and soap):
 Yes No
 9. At least one toilet accessible to people with limited mobility: Yes No
 10. Soap and water (or alcohol-based hand rub) currently available in consultation rooms:
 Yes Partially (e.g. lacking materials) No
 11. Soap and water currently available at toilets:
 Yes, within 5 m of toilets Yes, more than 5 m from toilets No, no soap and/or no water
 12. Sharps, infectious and general waste are safely separated into three bins in consultation room:
 Yes Somewhat (bins are full, include other waste, or only 1 or 2 available) No
 13. Treatment/disposal of sharps waste: Autoclave Incinerator (2 chamber, 850-1000 °C)
 Incinerator (other) Burning in protected pit Not treated, but buried in lined, protected pit
 Not treated, but collected for medical waste disposal Open dumping without treatment
 Open burning Not treated and added to general waste Other:_____(specify)
 14. Treatment/disposal of infectious waste: Autoclave Incinerator (2 chamber, 850-1000 °C)
 Incinerator (other) Burning in protected pit Not treated, but buried in lined, protected pit
 Not treated, but collected for medical waste disposal Open dumping without treatment
 Open burning Not treated and added to general waste Other:_____(specify)
 15. Protocols for cleaning (floor, sink, spillage of blood or bodily fluid) and cleaning schedule are available:
 Yes No
 16. All staff responsible for cleaning have received training: Yes Not all trained None trained
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Figure 3. Example of core questions adapted for national HMIS

7.3 Questionnaire

Project Topic: Assessment of the water, sanitation, and hygiene (WASH) standards in the healthcare facilities within the Bawku West District, Ghana.

District: Bawku West

Date: _____

Section 1: Respondent Information

1. Name of Facility: _____
2. Location of Facility (Community): _____
3. Sub-District: _____
4. Gender of Respondent:
 Male Female
5. Age of Respondent: _____
6. Designated Role:
 Health Worker Facility Manager Cleaner Other specify.....

Section 2: Water Supply

7. What is the Main water supply for the facility? (select one) Piped Tube well/Borehole
 Protected dug well Unprotected dug well Protected spring
Unprotected spring Rainwater Tanker truck Surface water
(River/Lake/Canal) No water source Other:_____
8. Where is the main water supply for the facility located?
 On premises Off premises but up to 500m More than 500m
9. Is water available from the main water supply at the time of the survey or questionnaire?
 Yes No
10. If no why? Give reason
11. How reliable is the main water source? (e.g., frequency of failure)

Daily Weekly Monthly Rarely Never

Section 3: Sanitation Facilities

12. What type of toilets/latrines are at the facility? (select one - most common):

- Flush/Pour-flush to sewer Flush/Pour-flush to tank or pit
- Flush/Pour-flush to open drain Pit latrine with slab/covered
- Pit latrine without slab/open Bucket Hanging toilet/latrine None

13. Number of usable (available, functional, private) toilets for the health care facility: _____
(insert number)

14. Are toilets separated for staff and patients and by gender: Yes No

15. If no why? Give reason

16. Do Female toilets have the following menstrual hygiene facilities?

- covered bin water and soap Private washing areas other specify.....

17. Are there toilets accessible for people with limited mobility: Yes No

18. If no why? Give reason

19. Frequency of toilet cleaning and overall odor control in toilets/latrines:

- High Medium Low

Section 4: Hygiene facilities

20. Soap and water (or alcohol-based hand rub) currently available in consultation rooms:

- Yes Partially (e.g., lacking material), No

21. If no why? Give reason

22. Is there a functional handwashing facility at one or more toilets?

- Yes, within 5 m of toilets

- No, there are handwashing facilities near the toilets but lacking soap and/or water

No, no handwashing facilities near toilets (within 5 meters) Note

Section 5. Waste Management

23. Are sharps, infectious, and general waste safely separated into at least three bins in the consultation area?

Yes, waste is separated into three labelled bins

No, bins are present but waste is not correctly separated

No, bins are not present

24. How does the facility usually Treat /dispose of sharps waste?

Autoclave Incinerator (2 chamber, 850–1000°C) Incinerator (other)

Burning in protected pit Not treated, but buried in lined, protected pit

Not treated, but collected for medical waste disposal

Open dumping without treatment Open burning

Not treated and added to general waste Other: _____ (specify)

25. How does the facility treat/dispose of infectious waste?

Autoclave Incinerator (2 chamber, 850–1000°C) Incinerator (other)

Burning in protected pit Not treated, but buried in lined, protected pit

Not treated, but collected for medical waste disposal

Open dumping without treatment Open burning

Not treated and added to general waste Other: _____ (specify)

26. Are cleaning protocols and schedules available for floors, sinks, and spillages?

Yes No

27. If no why? Give reason

28. All staff responsible for cleaning have received training?

- Yes Not all trained None trained

Section 6. Overall Health and Safety in Healthcare Facilities

29. Do you believe the facility's water, sanitation, and hygiene (WASH) practices ensure the safety of patients, visitors, and staff?

- Strongly Agree Agree Neutral Disagree Strongly Disagree

30. What do you think can be improved in this healthcare facility to enhance overall health and safety? (Tick all that applied)

- Improved cleanliness and regular disinfection
- Better waste management practices
- Availability of clean water at all times
- Improved toilet and handwashing facilities
- Training staff on hygiene and infection control
- Others (specify): _____

7.4 Interview Guide for Key Informants

Project Topic: Assessment of the water, sanitation and hygiene (WASH) standards in the healthcare facilities within the Bawku West District, Ghana.

Section 1. General Introduction

1. Can you briefly introduce yourself and your role in the healthcare system/organization?
2. How long have you been working in this role?
3. Can you describe a brief overview of WASH in this health facility?

Section 2: Water Supply

4. What is the main source of water for the healthcare facility?
5. Is water available on the premises at all times? If not, what are the major challenges?
6. Have you experienced water shortages, contamination, or issues with broken taps and leaks? How do these challenges affect patient care and operations?
7. Is the water available always clean and safe for use?
8. How is water quality ensured for use in the facility?
9. What are the other key gaps or challenges related to water supply in this facility?
10. How do water supply issues affect patient care and facility operations?
11. What specific improvements or support would help address these gaps?

Section 3: Sanitation Facilities

12. Can you describe the sanitation facilities in terms of adequacy, cleanliness, and functionality for staff, patients, and visitors?
13. Are sanitation facilities accessible to individuals with limited mobility?
14. Are there sanitation facilities or services tailored to the specific needs of female patients and staff (e.g., menstrual hygiene management)? What challenges do they face?

15. What are the challenges faced by patients and staff with regarding to sanitation and how do these challenges affect their comfort, safety, and hygiene?

16. What recurring operational challenges, such as blockages or maintenance issues, do sanitation facilities face?"

17. What improvements are needed to address sanitation challenges and better accommodate female patients and staff?

Section 4: Hygiene Practices

18. Are handwashing stations available, functional and stocked with soap, water, or hand sanitizers, and regularly maintained?

19. What are the barriers to ensuring consistent hygiene practices in the facility?

20. What support or resources would help improve hygiene practices in this facility?

21. Have you received any feedback or complaints from patients about the WASH facilities and practices in your healthcare facility? If yes, what were the main concerns?

22. How do you think patient experiences could be improved in terms of water, sanitation, and hygiene?

Section 5: Waste Management

23. How does the facility manage medical and general waste?

24. What protocols are in place for the safe disposal of medical waste, including sharps and infectious waste, and how are these practices monitored for effectiveness?"

25. Do cleaning staff have the necessary equipment and materials to perform their duties?

26. Are cleaning schedules followed consistently

27. What are the key challenges related to waste segregation, collection, and disposal?

28. What improvements or support are needed to address waste management challenges?

Section 6: Institutional Support and Capacity

29. What existing resources, partnerships, or community support systems could be leveraged to improve WASH standards in this facility?
20. How involved is the local community in maintaining or improving WASH standards in the healthcare facility? What specific roles can they play?
31. What support or guidance does the district health directorate, NGOs, or other stakeholders provide on WASH?
32. Is there a budget allocated for the provision and maintenance of WASH services and facilities?
33. Are there training programs for staff on maintaining WASH standards?
34. What are the main institutional or policy gaps that affect WASH services in this facility?
35. Are there specific areas where external support is urgently needed?

7.5 Field pictures showing the state and condition of the wash facilities in the healthcare facilities



7.6 Work Plan

ACTIVITIES	MAY	JUN	JUL	SEP	OCT	NOV	Dec	JAN-2025				FEB-2025				MAR-2025			
	2024	2024	2024	2024	2024	2024	2024	Week				Week				Week			
								1	2	3	4	1	2	3	4	1	2	3	4
Writing and Submission of Research Proposal																			
Literature review																			
Defense of Research Budget																			
Travel Home																			
Design Questionnaires																			
Visit to study area and Approval																			
Research Internship																			
Data Collection and Cleaning																			
Data entry and Analysis																			
Thesis Report Writing																			
Thesis Submission																			
Return to Algeria																			