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ASSESSMENT OF THE IMPLEMENTATION OF COVID-19 PREVENTION PROTOCOLS IN SELECTED HEALTH FACILITIES IN THE KASSENA NANKANA DISTRICT OF GHANA.

BY

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THIS DISSERTATION IS SUBMITTED TO THE UNIVERSITY OF GHANA, LEGON IN PARTIAL FULFILMENT OF THE REQUIREMENT FOR THE AWARD OF THE MASTER OF SCIENCE PUBLIC HEALTH MONITORING AND EVALUATION DEGREE.

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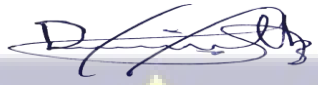
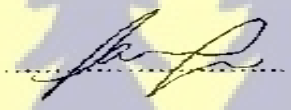
DECLARATION

I, Enos K. Daniel Sekwo hereby declare that apart from specific references made which have been duly acknowledged, this research work is my independent work undertaken under the supervision of Prof. Paulina Tindana. I also declare that no part of this proposal has been submitted for the award of any degree in this University or any University elsewhere.

Enos K. Daniel Sekwo		15-02-2023
(Principal Investigator)	(Signature)	Date
Prof. Paulina Tindana		15-02-2023
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DEDICATION

This work is dedicated to the CEBioGen team especially the ELSI-core of the project and to all who died from COVID-19.

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Thanks, Thanks be to the Lord our God! I wish to acknowledge the following people for all their efforts and contributions to make this work a success. My supervisor, Prof. Paulina Tindana, Dr. Raymond Aborigo, the Navrongo Health Research Centre, my research assistants, my family and friends, and the good people of Paga and Navrongo. God bless you all for playing diverse roles in making this work a success. Special thanks to the United States National Institutes of Health/National Human Genome Research Institute (NIH/NHGRI) for funding the H3Africa CEBioGen project which supported my masters training at the University of Ghana School of Public Health and my research project at the Kassena-Nankana districts.

ABSTRACT

Background: In 2020**,** World Health Organization declared COVID-19 a global pandemic and recommended key preventive protocols, such as proper and frequent handwashing, physical distancing, and wearing of face masks, to contain the spread of the disease. Effective implementation of these protocols faced several challenges for health workers and non-healthcare workers.

Aim: The study assessed the implementation of COVID-19 prevention protocols in selected health facilities in the Kassena-Nankana districts.

Method: The study employed a hospital-based cross-sectional study design, using a quantitative and qualitative research approach including observations, surveys, facility assessments, and in-depth interviews to answer the research questions. Qualitative data were coded and analyzed thematically using NVivo 12 qualitative analysis software while bivariate analysis and a multivariate logistic regression model were used to determine the actual factors associated with adherence to COVID-19 protocols.

Results: Overall, adherence to prevention protocols was low with about 61.1% of participants having low adherence. Participants had adequate knowledge of COVID-19 prevention protocols (60.7%) but health facilities struggled to make available the prevention protocol materials. Knowledge and enforcement were found to be the factors that influence low adherence as participants with inadequate knowledge were two times more likely (2.30) (p-value; <0.001) to have low adherence and participants who were not reminded about the protocols being six times (5.78; p-value; <0.001) more likely to have low adherence. Implementation challenges included logistics, implementer motivation, facility environment, and finance.

Conclusion: The study concludes that adequate knowledge of COVID-19 in the district did not positively reflect adherence, as expected. Health facilities in the district lack prevention protocol materials to effectively implement the protocols. Inadequate knowledge and poor enforcement significantly influence low adherence and the key challenges of logistics, finance, lack of cooperation, the burden of work, security challenges, and the hospital environment impede the implementation of the prevention protocols in the health facilities within the KND. Lessons learned in this study should guide.

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LIST OF ABBREVIATIONS

Abbreviation	Meaning
CDC	Centre for Disease Control
CEBioGen	Community Engagement in Biobanking and Genomics
DHMT	District Health Management Team
HCW	Healthcare worker
HMT	Hospital Management Team
KND	Kassena Nankana District
MOH	Ministry of Health
NHDSS	Navrongo Health and Demographic Surveillance System
NHRC	Navrongo Health Research Centre
NHCW	Non-Healthcare worker
NIH	National Institute of Health
PDH	Paga District Hospital
PI	Principal Investigator
PPE	Personal Protective Equipment
WHO	World Health Organization
WMH	War Memorial Hospital

CHAPTER ONE: INTRODUCTION

1.1 Background of the study

Coronavirus disease 2019 (COVID-19) is an infectious disease caused by coronaviruses, specifically, severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2). The disease was first reported in the Wuhan Province in China in December 2019 and has affected more than eighteen million people globally, with over six hundred thousand deaths (Kamel Boulos & Geraghty, 2020). The World Health Organization (WHO) declared COVID-19 a pandemic on 11th March 2020 when it had spread across almost all the continents of the world (WHO, 2020e). COVID-19 is a highly transmissible disease with a basic reproductive number estimated to be higher than that of severe acute respiratory syndrome (SARS), which only affected 26 countries and caused about 8,000 deaths in 2002 (Rocklöv et al., 2020).

COVID-19 is transmitted from person to person through small droplets from the nose or mouth, which are expelled when a person with the disease coughs, sneezes, or speaks, and also via contact with fomites (Aylward & Liang, 2020; WHO, 2020b). The virus has been shown to survive outside a host for durations that depend on the nature of the surface. It is reported to survive in the air for up to 3 hours, on copper surfaces for up to 4 hours, on cardboard for up to 24 hours, and plastic and stainless steel, for up to 72 hours (Van Doremalen et al., 2020). Common symptoms of COVID-19 include fever, cough, colds, headaches, and difficulty in breathing. Available evidence suggests that the pathogenicity of SARS-COV2 depends on host factors such as age and other comorbidities (Atri et al., 2020; Kraemer et al., 2020; Rothan & Byrareddy, 2020; Wu et al., 2020). There is, currently, no approved treatment for COVID-19 and the symptoms keep varying from person to person (Aylward & Liang, 2020).

The first two cases of COVID-19 in Ghana were reported on 12th March 2020 (Ghana Health Service, 2020). By April 19th, 2020, more than 1,000 confirmed cases of COVID-19 and nine deaths had been reported (Ghana Health Service, 2020). It is not clear when the first case of COVID-19 was recorded in the Kassena Nankana Districts but by the 25th of January 2021, about 17 healthcare workers and 10 patients were infected with one death of a nurse in line of duty (Ghana Health Service, 2020). To reduce person-to-person transmission of the virus, the Government of Ghana adopted and promoted the WHO's recommendations (safety prevention protocols) (WHO, 2020d), which include avoiding or limiting physical contact (including handshake and other forms of body contact), regular handwashing with soap under running water, rubbing of hands with alcohol-based sanitizers with up to 70% alcohol strength, wearing of a facemask to cover nose and mouth, reducing/limiting large gatherings among the general populace, as well as coughing into the elbow or tissue and disposing it immediately into a bin. The government and the ministries concerned also adopted and localized some preventive behavioral change messages that are being disseminated through the media (radio, television, social media, and print media), nationwide (WHO, 2020d).

Emphasis has been placed on ensuring adequate handwashing and social distancing in all public places, including hospitals, markets, and transport terminals (Ghana Health Service, 2020; WHO, 2020d). This is partly because the majority of rural and urban-dwelling Ghanaians rely on open markets for groceries and public transportation for daily commuting. Public transportation stations in many parts of Ghana including the Kassena Nankana Districts (KND) are usually not spacious and are characterized by high vehicular and human density, especially on market days or during rush-hours (Bonful et al., 2020). Also, Primary health care facilities (PHCs) in many parts of Ghana including the Kassena Nankana Districts (KND) are the first point of call for many residents who may

feel sick or in need of one health service or the other whether the health facility and the staff are well prepared or not to deliver such services. Transmissions of the coronavirus remain high across many districts in the country, putting healthcare workers (HCWs), who are directly in contact with patients at a high risk of getting infected in the healthcare setting (Afulani et al., 2020).

By the end of January 2020, the WHO and CDC (Centers for Disease Control and Prevention) had published recommendations for the prevention and control of COVID-19 for HCWs (CDC, 2019; WHO, 2020a). The WHO also initiated several online training sessions and materials on COVID-19 in various languages to strengthen the preventive strategies, including raising awareness, and enhancing HCWs' preparedness (WHO, 2020c). Several instances point that a misunderstanding of the virus and the need to follow these laid down protocols by HCWs and patients delay the efforts to control or to provide necessary treatment (Hoffman & Silverberg, 2018), thereby implicating rapid spread of infection in hospitals (McCloskey & Heymann, 2020; Selvaraj et al., 2018) and putting the patients' lives at risk.

With the advent of vaccines and appeals for all to be vaccinated, the United States Centres for Disease Control (US CDC) has stated emphatically that a person who obtains a COVID-19 vaccine should continue to observe the safety protocols to prevent breakthrough infections (CDC, 2020b). The basic means of reducing infection, morbidity, and mortality from the virus remains the right behavior towards the virus. The right behavior may include but is not limited to social distancing, wearing a nose mask in a public setting, and proper hand hygiene (CDC, 2020a). The spread of new variants of the virus in 2021 could be linked to the inconsistent avoidance of harmful behaviors among the world's population despite the general awareness of the safety precautions and the impact of the disease on the world (O'Connell et al.,2021).

In this regard, the COVID-19 pandemic offers a unique opportunity to assess the implementation of COVID-19 prevention protocols in selected health facilities and explore the challenges in implementing the COVID-19 protocols during this peak period.

1.2 Problem Statement

Globally, little evidence exists on transmission patterns of COVID-19. As a novel virus, scientists and governments across the world are still learning the genetics of the virus and how to overcome it. There are uncertainties regarding who is likely to catch the disease, its potential severity, and management (Jin et al., 2020). The WHO-the lead organization of the world's health has depended on the available information about the virus, to set out certain recommendations that could reduce or prevent infection or transmission of the virus. These recommendations to prevent infection include proper and frequent handwashing, physical and social distancing, wearing of nose masks, and limiting social gatherings (staying at home) (WHO, 2020e). While the virus and its devastating effects looked farther from Ghana, Ghana confirmed the first case of COVID-19 on March 12th, 2020, barely four months after the outbreak in Wuhan and a day after the WHO declared the virus a pandemic. Since then, the case incidence in Ghana has risen sharply despite the adoption and promotion of the WHO safety protocols in Ghana (Ghana Health Service, 2020).

Healthcare facilities around the world and for that matter in Ghana have been largely hit by the virus especially as they are the first point of call for many patients. Most patients have not heeded the recommendation from the WHO to call in for directions before reporting to the facility, therefore, causing more spread and implicating healthcare workers who fail to increase clinical suspicion (WHO, 2020d). Healthcare workers and patients at the facilities are at risk of either

contracting or transmitting the virus (Afulani et al., 2020) In several instances, lack of knowledge, poor adherence, and compliance with the preventive measures of the infectious disease implicate rapid spread of the virus and put both the patient and health worker at high risk (McCloskey & Heymann., 2020). While the government of Ghana adopted and promoted the safety precautions for the Ghanaian population, ("Coronavirus," 2020), reports of the upsurge of infections across various districts leaves much to be desired and in KND in particular, where there are about four deaths, and over 21 patients in the major referral facility of the district. (Bonful et al., 2020; Ghana Health Service, 2020). This situation could be linked to the inability of the population to follow the safety precautions religiously (O'Connell et al., 2021). This breeds a research interest to understand how well the protocols are implemented and followed in rural districts of Ghana. Also, no studies have been conducted to assess the implementation of COVID-19 prevention protocols in health facilities in the Kassena-Nankana district since Ghana recorded its first case.

Hence to facilitate outbreak management of COVID-19 in Ghana and the KND, there is an urgent need to understand adherence to COVID-19 prevention protocols among health facility users (largely healthcare workers and non-healthcare workers) including the challenges in implementing the COVID-19 protocols at this critical moment.

1.3 Objectives of the study

1.3.1 Aims

The general aim of this study was to assess the implementation of COVID-19 prevention protocols in selected health facilities in the Kassena-Nankana district.

1.3.2 Specific Objectives

To achieve the general objective of this study, the study addressed the following specific objectives:

1. To assess the level of adherence to COVID-19 prevention protocols among healthcare workers and non-healthcare workers in selected health facilities
2. To assess the availability of COVID-19 prevention protocol materials at vantage points in health facilities
3. To determine the factors influencing adherence to COVID-19 prevention protocols among non-healthcare workers
4. To explore the views of health workers on challenges in implementing the protocols

1.3.2 Research Questions

1. What is the level of adherence to COVID-19 prevention protocols among healthcare workers and non-healthcare workers in health facilities?
2. Are prevention protocol materials provided at vantage points in the health facilities?
3. What are the factors influencing adherence to COVID-19 prevention protocols in selected health facilities?
4. What are the views of facility users on the challenges in implementing the COVID-19 protocols?

1.4 Justification

Understanding the situation of adherence to COVID-19 prevention protocols is necessary for the revision and implementation of safety protocols. This study provides information regarding the adherence to COVID-19 prevention protocols among healthcare workers and non-healthcare workers in selected health facilities in the Kassena Nankana District. The study also provides information on the availability of COVID-19 prevention protocol materials at vantage points in health facilities, the factors influencing the adherence to COVID-19 prevention protocols among

healthcare workers and non-healthcare workers, and their views on challenges in implementing the protocols. The findings of this study could enable policymakers in the MOH, Ghana Health Service, and their collaborating agencies to design innovative strategies that would help improve the implementation of COVID-19 prevention protocols in health facilities. The results of this study may also serve as a baseline for more research in the future regarding the gap between establishing prevention protocols, implementation of the prevention protocols, and adherence/compliance with the prevention protocols, as well as the challenges therein.

1.5 Conceptual Framework

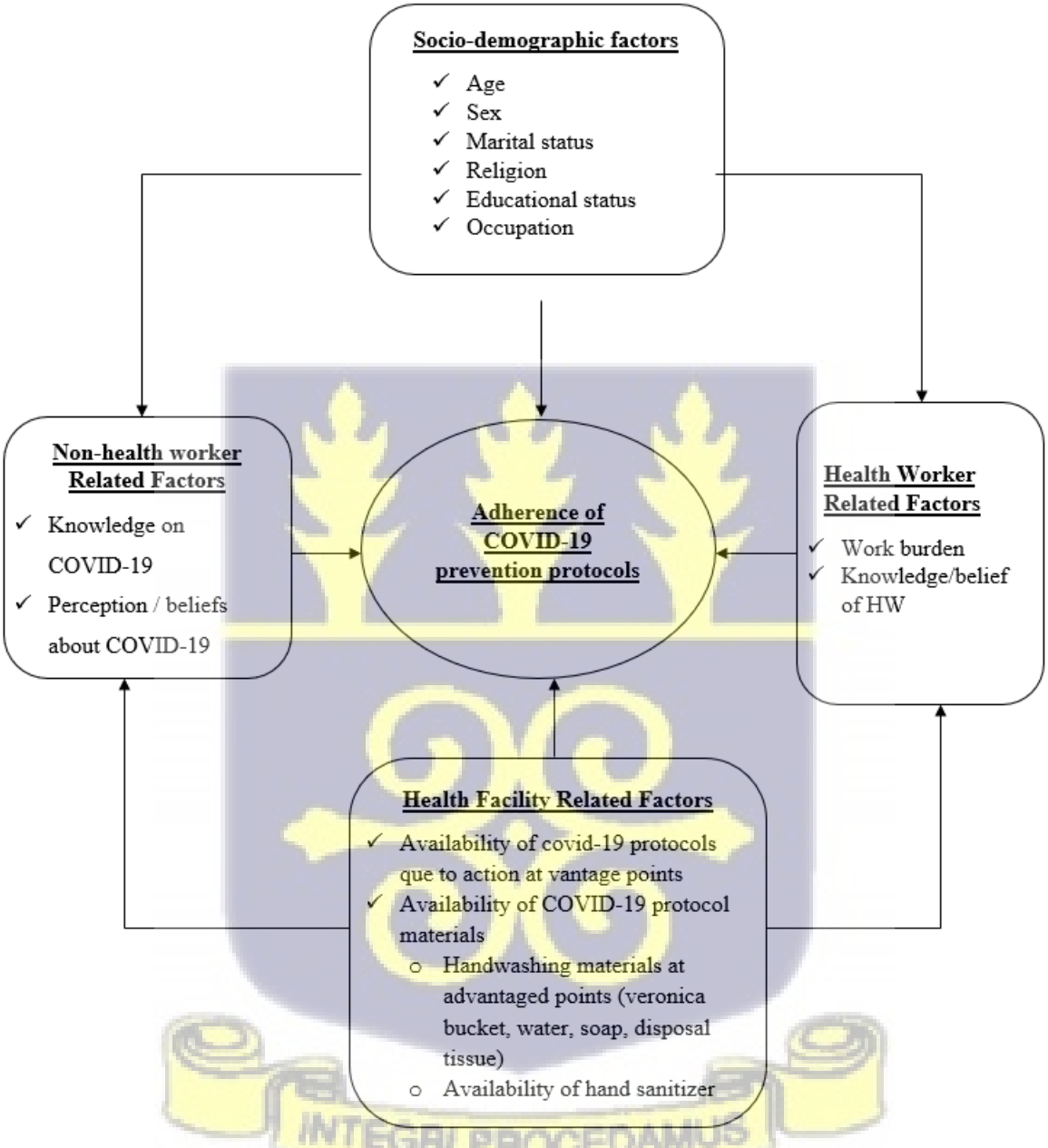

Figure 1. 1: Conceptual framework of factors influencing the implementation of COVID-19 prevention protocols

Source: Author's construct, 2021

1.5.1 Narration of conceptual framework

In figure 1, the adherence to COVID-19 protocols is the outcome of the study. The framework illustrates a relationship between the various factors and how they interrelate to influence the outcome variable (Adherence). The socio- demographic factors of a person such as age, sex, educational status, occupation, and religion will directly affect his/her knowledge and perception of the COVID-19 protocols and will influence his/her adherence as explained in literature (Ashinyo et al., 2021; Piché-Renaud et al., 2021).

The health facility is supposed to be the implementing body with the ability of the structure and the systems within it to directly influence its users in terms of ensuring or enforcing the protocols. The health facility-related factors such as the availability of COVID-19 cue to action at vantage points, constitute some form of health education or awareness for both healthcare workers and non-healthcare workers and indicate attempts of implementation. As in other studies, an educated person who is within the age range of 30-39 would most likely notice cue to action on display and may already have prior knowledge of the COVID-19 prevention protocols. Such a person is influenced by the interaction between his or her demographics and the facility related factors to be adherent with the prevention protocols. This directly impacts facility users' knowledge of the protocols and their likelihood to adhere (Abeya et al., 2021; Fenerty et al., 2012) Again, the availability of prevention protocol materials such as veronica buckets, soap, tissue, and hand sanitizer at vantage points in the health facility affects the belief/perception of both patients and health workers as the facility's portrayed seriousness with the virus would make users appreciate what is at stake For instance, a person may only acknowledge that there is a health emergency when they notice the seriousness within the facility. When they notice that things are done differently within the health facility, and they have already been exposed to some knowledge or

education of the COVID-19 pandemic based on their demographics or the facility related factors, then they may be more likely to adhere. (Abeya et al., 2021).

CHAPTER TWO: LITERATURE REVIEW

2.1 Introduction

This chapter reviews relevant literature on the topic to highlight the gap and the depth of the research questions. The literature review is drawn from writings and theories of scholars who have contributed knowledge to the subject matter under review. The literature review is divided into subtopics to include COVID-19, response to the COVID-19 pandemic, the COVID-19 prevention protocols, the concepts of adherence, factors that influence adherence/compliance with COVID-19 prevention protocols including socio-demographic factors, non-health worker- related factors, health facility-related factors, health worker-related factors, and challenges of implementation of protocols.

2.2 Background information on COVID-19

The coronavirus disease is the world's most devastating issue of recent time that is causing so much havoc to health systems around the world (O'Connell et al., 2021). The world woke up to the devastating news later in the year 2019 and nothing has been the same for any sector, especially for health systems around the world that continue to experience the greatest impact. (WHO, 2020e, Zhu & Cai, 2020)).

The coronavirus disease otherwise known as SARS-CoV-2 is a respiratory infection caused by a newly discovered coronavirus that affects the lungs of infected persons, causing mild to moderate respiratory illness. Depending on factors of the host such as age, comorbidities including diabetes, cardiovascular disease, cancer, or chronic respiratory disease, a person may suffer more serious illness and may require treatment or medical attention to recover (Jin et al., 2020).

The COVID-19 virus spreads from person to person through droplets of saliva or discharge from the nose of an infected person, with a mean infection incubation period estimated at 5.2days. While

there are several speculations as to the actual source of the virus, bats are likely an important source of SARS-CoV-2 (Jin et al., 2020). There is still no specific treatment for the virus and steps must be taken to curtail the viral infection (Jin et al., 2020). The most current issue around the virus is the development and deployment of vaccines to stop the spread and protect the world's population (*COVID-19 Vaccines*, n.d.). This venture is however yet to be assessed for success in middle or low-income countries in Africa (Gidudu et al., 2020) and in some parts of the West where the available vaccines are characterized by complex adverse events ("AstraZeneca Vaccine," 2021).

Globally, over 3,330,000 people have fallen ill with morbidity cases becoming mortalities. The current morbidity and mortality rates of the virus remain an important issue for the World Health Organization and its partners (WHO, 2020d).

In Africa, the virus has wrecked more havoc on the already unstable health systems. While the impact of the virus in the Western countries cannot be compared to that of Africa, especially in terms of morbidity and mortality, the region has had a fair share of the impact which has affected every sector of the economy including agriculture, education, and above all health (*Exploring the Impact of COVID-19 in Africa*, n.d.). The situation in a vast continent such as Africa can even be more complex as many countries in the continent have insufficient testing and limited data on tests to understand the true reflection of the virus on the ground. ("COVID-19 in Africa," 2021). The region has seen a significant increase in new cases and COVID-19 related mortalities. As at 2021, the Africa CDC reported that there were about 4,587,568 cases in Africa with a total death toll of about 122,969 ("Africa CDC - COVID-19 Daily Updates," n.d.). With the presence of the vaccine in a multifaceted and complex continent characterized by poverty, political instability and other inherent frailties, the African population across various countries have worries over the inadequacy

of the vaccine for the entire population, and the general potency of the vaccine and what the potential risk and harm may be ("COVID-19 in Africa," 2021). To demystify the fears and misconceptions around the vaccine, the Africa CDC, the public health agency of the African Union, released a statement assuring Africans that the vaccine is safe and potent for the fight against the virus ("Statement to African Union Member States on the Deployment of the AstraZeneca COVID-19 Vaccine to the Continent and Concerns about Adverse Event Reports Coming from Europe," n.d.)

The situation in Ghana is not very different from other countries in Africa. Ghana has since the inception of the pandemic been applauded for the strategies taken to contain the virus. Even though the testing capacity of the country may be inadequate, the Ghana government continues to work with the health partners to ensure that information about the virus is available to all (Quakyi et al., 2021). The case count in Ghana as of 2nd May 2021 stood at 1,583 active cases with a death toll of about 783.

The Upper East region is one of the regions that continue to record cases of the virus partly due to the presence of an active testing center. The morbidity and mortality situation of the region has not been stable as different points in time reflect either high or few infections. The Kassena Nankana District, one of the few vibrant districts in the region has also had a fair share of the community spread to the extent of losing some healthcare workers and many indigenes. The War Memorial Hospital (WMH) has had to close down certain wards in the facility at certain points to contain the spread (*Coronavirus*, 2021; *COVID-19*, n.d.; *Upper East Region Records 3 COVID-19 Related Deaths This Month*, n.d.).

2.3 Response to the COVID- 19 pandemic

After declaring the coronavirus disease, a pandemic, the WHO took the forefront to support and assist governments and agencies around the world to take action against the virus. Little understanding of the virus through the efforts of the WHO and all the other scientific bodies that work together generated information that informed the prevention protocols that are widely adopted across the globe. Apart from the prevention protocols, the WHO has facilitated the manufacturing and supply of PPEs, the development, and deployment of vaccines, and the availability of experts as a way to respond to the pandemic (WHO, 2020e).

The effort in Africa has not been any different since the first recorded case in Egypt. According to the CDC, sub-Saharan Africa reported its first case in February 2020 in Nigeria. Since then, Africa has dwelt on the experiences of the Ebola epidemic to fight the current pandemic. With efforts including lockdowns and restrictions to movement and social gatherings, intensified case finding and testing, as well as other public health and social measures such as self-isolation and the establishment of centers for quarantining cases, crowned with the frequent and transparent communications around the virus in most countries of the region, Africa appears to be responding quite well to the pandemic even though these efforts are largely derailed by poverty and inadequate health access (Ihekweazu & Agogo, 2020; *The COVID-19 Pandemic in Africa*, n.d.).

The response in Ghana has been recognized as one of the best in Africa (CDC, 2020b). Centered on four main goals; thus, to slow and stop transmission, prevent outbreaks and delay spread, provide care for all patients, and minimize the impact of the pandemic on the health system, social services, and economic activity, the government of Ghana in consultation with relevant stakeholders set out to achieve these goals through the implementation of some strategies. Firstly, there were budgetary allocations for several sectors including health and support for the production and distribution of

PPEs. Lockdowns, closure of schools and bans on social gatherings, adoption, and enforcement of WHO's recommended safety protocols, enhanced contact tracing, hospitalization, and treatment of cases have all been implemented in Ghana quickly in response to the pandemic. Health facilities and health workers have been provided with PPEs and a commitment to give incentives to health workers for their efforts has also been met. Other actions in other sectors include tax waivers and support for small and medium scale industries. These measures were implemented both at the national and local level with emphasis on districts to tailor these measures for easy adoption at the district level. Interestingly, there is a gap in knowledge on the impact as well as the implementation of these measures at the district level (Dwomoh et al., 2021; *Ghana*, 2020; Hoffman & Silverberg, 2018; Quakyi et al., 2021).

2.4 COVID-19 Prevention Protocols

The WHO has outlined some simple precautions to contain the spread of the virus worldwide and keep individuals safe. These safety precautions include the practice of regular handwashing with soap under running water, the use of a mask to cover the nose and mouth, and physical distancing. Other recommendations from the WHO also include coughing into a bent elbow or tissue, and the habit of keeping rooms well ventilated. The WHO also admonishes individuals to listen and follow all laid down recommendations from local health authorities and governments (*Advice for the Public on COVID-19 – World Health Organization*, n.d.). The various precautions from the WHO have been widely adopted and implemented by governments across Africa.

The Africa Center for Disease Control and Prevention has taken and promoted these prevention protocols. They have narrowed these recommendations to the regional level to guide African governments and health systems, and have established guidelines based on the WHO recommendations on how to use or execute efficiently, each of these safety precautions (CDC,

2020b).

In Ghana, the Ministry of Health, the Ghana Health Service, and the Government of Ghana have collaborated to adopt and promote these prevention protocols. Ghana aims to stop the spread of the virus by reducing new infections, morbidity, and death through the enforcement of the WHO recommendations. To this end, the Ghana government has put in place further restrictions to control the community's spread of the virus (*Ghana*, 2020). Little has however been considered for the health facilities in the country in terms of supporting or assessing the implementation of the protocols in the facility setting. The various safety precautions are discussed in detail in subsequent paragraphs.

2.4.1 Face Masks

According to the CDC, a nose mask is a loose-fitting and single-use device that covers the nose, mouth, and chin. A nose mask provides a physical barrier against potentially infectious droplets and is a simple and low-cost non-pharmaceutical individual intervention for protecting oneself and preventing the spread of respiratory infections (Center for Disease Control and Prevention [CDC], 2019). The World Health Organization recommends the use of nose masks to prevent the spread of respiratory infections including but not limited to COVID-19 (CDC, 2019; Centre for Health Protection [CHP], 2020; World Health Organization [WHO], 2020). The nose mask is expected to be used at all times by every individual, especially at enclosed places such as markets, offices, public transport, and health facilities (Dzisi & Dei, 2020). A simple cloth covering should be enough for individuals who may not have access to a surgical mask since the idea is to protect an individual's droplets from getting out onto other people (Greenhalgh et al., 2020).

While the use of a facemask may be quite basic, the safety precaution has met increasing resistance to compliance by many Ghanaians with issues of discomfort, loss of mimical communication including an inability to see the smiles of loved ones, and forgetfulness. It takes authorities at various departments to get some people to comply even though a lot of people agree and acknowledges the mask is protection for themselves and the people around them (*COVID-19: Face Masks and Human-to-human Transmission - Liu - 2020 - Influenza and Other Respiratory Viruses - Wiley Online Library*, n.d.; Howard et al., 2020).

2.4.2 Social/Physical distancing

According to WHO, the practice and enforcement of social distancing are as critical as all the other measures because the virus only spreads from person to person and an effort to break the chain of transmission by being distant from others should be a concern for every person in the world (WHO, 2020d). According to the US CDC, limiting face-to-face contact with others remains the best way to curtail the spread of coronavirus disease (CDC, 2020a). Social distancing is a public health practice aimed at preventing sick persons from coming in contact with healthy people, especially in infectious disease situations, to reduce the risk of disease transmission. The practice ranges from large-scale measures such as canceling large gatherings as instituted by authority or personal decisions to avoid crowds (Mar 13 & 2020, 2020). There is currently a transition in terminology to refer to this practice as "physical distancing" instead of "social distancing". Proposers of the transition argue that the practice aims to physically distance people who could be socially connected virtually. A change in the terminology will reduce the impact of quarantine and isolation on the mental health of people (*Should We Say "Physical" Distancing Instead of "Social" Distancing?* n.d.).

Some of the steps to practice social distancing as outlined by the CDC include avoiding hugs and handshakes, avoiding mass gatherings, and maintaining a distance of about 6feet or 2 meters from other people (CDC, 2020c).

In Ghana, the government in consultation with the ministry of health and the Ghana Health Service outlined some restrictions to help Ghanaians maintain social distance, especially at the peak of the virus. These steps include further restrictions and bans on public gatherings, demarcation of places including pharmacies, health facilities, banks, and offices to show the allowable distance that users of such facilities could be away from the other person, and the use of virtual mode for all activities including school and worship ("Coronavirus," 2020; Dzisi & Dei, 2020; O'Connell et al., 2020).

2.4.4 Hand hygiene through washing and use of sanitizers

Regular and proper handwashing is considered the most important hygienic principle. It is the one single determinant of the relevance of all other protocols such as wearing a mask or social distancing. It will not be very prudent to wear a mask the entire day and then take it off and touch your face or eyes with unwashed hands (Welle (www.dw.com), n.d.). Before the pandemic, the WHO and the CDC already established some guidelines for hand hygiene among healthcare workers. The situation of the pandemic has caused an extension of this practice to include every user of health facility. The merits of regular handwashing with soap under running water, especially in times of an infectious disease cannot be overemphasized (CDC, 2020d).

To ensure compliance with handwashing within facilities in Ghana, the use of veronica buckets has become popular. Every health facility, transport station, market, and other open places are required to provide functional veronica buckets with constant water supply, soap, tissue, and dustbins at vantage points for use by individuals who visit (Bonful et al., 2020; Dzisi & Dei, 2020).

Several studies have identified handwashing as the most simple, easy, and effective preventive measure for IPC. Handwashing is arguably the simplest protocol to comply with and it is practiced by both healthcare workers and non-healthcare workers (Azene et al., 2020; Banerjee, 2020; Fuls et al., 2008).

2.5 The concept of adherence

The novel coronavirus disease that continues to cause mild to severe disease in the human population around the world has no potent treatment yet despite the development and deployment of some vaccines. The arm against the battle remains a behavioral change to include improved hygiene and exercises (CDC, 2020a; Quakyi et al., 2021; Xie et al., 2020). Despite the consensus that adherence to the preventive protocols is the only way to defeat the virus, studies have shown inadequate adherence in communities and transport systems (Azene et al., 2020; Bonful et al., 2020)

The concept of adherence has been studied extensively in medical research. A lot of the studies done around adherence are on patient adherence to medication for some diseases or healthcare workers' adherence to some procedure or work protocols (Bissonnette, 2008; Chatio et al., 2015; "Measuring Adherence to Behavioral and Medical Interventions | Request PDF," n.d.). Most of the studies however do not have a unified scale of measurement for adherence, hence authors operationally define their measurements of what adherence or compliance with the phenomenon under study would mean (Bargain & Aminjonov,2020; Roma et al., 2020; Saechang et al., 2021).

2.6 Factors that influence adherence to COVID-19 prevention protocols.

The factors that influence adherence generally depend on several things. Knowledge around the subject matter, the individual beliefs around the phenomenon, social demographic issues such as age, gender, and educational level as well as institutional factors including laws and cues to action. These factors have been broadly categorized by other authors in other scientific fields as socio-demographic factors, non-healthcare worker-related factors, healthcare worker-related factors, and facility-related factors (Piché-Renaud et al., 2021; Xie et al., 2020).

2.6.1 Socio-demographic factors that influence adherence/compliance with prevention protocols

Most studies around COVID-19 employed descriptive analysis without actually uncovering factors that influence adherence to preventive protocols. The socio-demographic characteristics of people including healthcare workers and non-healthcare workers play a very big role in how they perceive and relate to issues. The gender of a person, the level of education, age, occupation, and other socio-demographic characteristics have been referred to as the basis for the formation of other variables (Ashinyo et al., 2021; Piché-Renaud et al., 2021).

A study in Ethiopia revealed that the socio-demographics of participants in the study such as their age or educational level showed a high likelihood for adherence to safety protocols. (Azene et al., 2020). Similar studies for healthcare workers in Canada and Ghana also revealed that the socio-demographics of healthcare workers influenced their attitude to personal protective equipment and their general compliance with preventive protocols (Ashinyo et al., 2021; Piché-Renaud et al., 2021).

2.6.2 non-healthcare worker-related factors that influence adherence to prevention protocols

There are factors that cause non-healthcare workers (patients or their relatives to either comply or refuse to comply with preventive protocols. Several studies have identified that the knowledge level of non-healthcare workers and their perception about the virus determines their attitude towards adherence or compliance. A study in Ethiopia revealed that the likelihood for non-healthcare workers to comply with prevention protocols was directly dependent on the level of their knowledge of the protocols, and their perceived risk of infection (Azene et al., 2020). A similar study in China among non- healthcare workers also showed that non-healthcare workers' knowledge and perceptions of the virus and protocols influence their ability or willingness to comply (Xie et al., 2020) while arguing that non-healthcare workers in the facility setting are likely to emulate the example of healthcare workers. This assertion is however different in another study which explains that while non-healthcare workers including patients may likely remember elements of their experiences in the facility, patients are likely to remember actions that were carried out on them or some things that were required of them such as asking for stool samples or listening to their heartbeat, but may not be able to recognize or notice the other technical aspects of clinical care such as healthcare workers washing their hands or respecting their privacy (Aujla et al., 2021).

A study by Azene et al, (Azene et al, 2020) reported that a negative attitude towards the prevention protocols for COVID-19 is fueled by a lack of knowledge, misconceptions around the virus, and the perception of not being at risk of infection. Most non-healthcare workers who have not had the opportunity to see infected persons still doubt if the virus affects everybody and think of it as a stigmatized disease for the aged and people of a certain class.

2.6.3 Health worker-related factors

The reasons why healthcare workers may or may not comply with COVID-19 prevention protocols are not very different from that of non-healthcare workers. Within an outbreak setting, perceptions and confidence in prevention control measures influence healthcare worker adherence. Inconsistent use of materials due to inadequate logistic supply, lack of training to improve knowledge among others are outlined as the healthcare-related factors that influence adherence or otherwise with COVID-19 prevention control in Canada (Piché-Renaud et al., 2021).

While healthcare worker compliance may be generally high, a study revealed that this compliance varied across factors including the type of healthcare worker, knowledge of virus, perceptions, and beliefs about virus and protocols, as well as other socio-demographic factors of healthcare workers (Ashinyo et al., 2021).

Studies around the healthcare worker as a factor to adherence or compliance with COVID-19 protocols have shown that the workload of healthcare workers affects their ability to practice or comply with COVID-19 protocols, especially handwashing (Felice et al., 2020). Healthcare workers in the studies report that it is difficult to keep washing hands from patient to patient as the volume of work increases. The impact of workload on the mental health of healthcare workers in the pandemic situation is crucial and countries like Italy are providing psychological support for healthcare workers (Felice et al., 2020).

In the case of a COVID-19 outbreak, adherence to all severe occupational requirements by healthcare workers is crucial because they are the occupational categories most at risk of contracting the virus during the pandemic (World Health Organization, 2020a). In Italy, because they were not promptly provided with self-protective equipment such as gowns, gloves, N95

masks, goggles, and so on, or given sufficient IPC (infection prevention and control) training, healthcare workers in life-threatening healthcare settings, with longer duty hours, are more exposed to the pandemic and need support to consistently comply with prevention protocols while on duty (Carlucci et al., 2020)

2.6.4 Facility-related factors

Facility-related factors are the circumstances or situations at the health facility that either promote or impede adherence to COVID-19 prevention protocols. For facility users to be compliant with safety precautions, the Joint Commission on Accreditation of Healthcare Organizations posits that there should be clearly labeled materials and demarcations for people to follow. Clear labels improve facility internal non-verbal communication and remind users to adhere (Abeya et al., 2021; Fenerty et al., 2012; n.d.). One key role of the health facility is infection control. The importance of infection control in healthcare facilities has become more important, especially with the presence of the pandemic. A study posits that the ability of health facility managers to give training to the staff and improve the ability of staff to practice safe and proper hand hygiene can influence general adherence to the facility. Technology and other functional materials also available at the facilities increase the likelihood of compliance as compared to instances where these are not available (Abeya et al., 2021). Other opinions support this assertion that the presence of a water management system to support hand hygiene and well-ventilated spaces to reduce infections will go a long way to improve adherence to these facilities.

2.7 Challenges of the implementation of prevention protocols

Different users of healthcare facilities face different challenges at different points in time. Even though there may be more general challenges within the facility that affects every user including managers and other healthcare workers, the major challenges that healthcare workers face may differ from the challenges of non-healthcare workers within the health facility. A study of healthcare workers' challenges revealed that they are unable to fully comply with prevention protocols when they spend long hours in the facility, wearing a nose mask for a longer period and using the same logistics to care for multiple patients (Rostami & Neshati-Khorram, 2020). The healthcare workers posit that the pandemic has increased their workload because they have more patients coming in at a point in time using the same limited logistics and facilities. Apart from logistics challenges, there are also demographic and personal challenges, as well as political challenges including the will of the government to supply facilities with the needed stock supplies to improve adherence. These challenges are similar in most studies and either focus on the lack of logistics, patients' knowledge or beliefs, health workers' workload, and perceptions, or institutional management support systems (Amugsi et al., 2015; Arianpoor et al., 2020).

The challenges which hinder the implementation of prevention protocols may include a lack of administrative commitment and support as well as community support. The implementation of COVID-19 prevention protocols is heavily reliant on administrative assistance for maintenance, involvement, and motivation of the process (Dassin & Kim, 2020). According to the WHO standards, lockdowns, and restrictions should be placed by local governments and authorities in certain places to reduce the transmission rate of the virus (WHO COVID-19 situation report, 2020). The ability and willingness of authorities and local governments to ensure that people are

offered their necessities and sufficient education to support the process are however inadequate (Human rights dimensions of COVID-19 response, 2020).

The pandemic has also intrinsically increased demand for drugs, immunizations, testing facilities, diagnostics, and reagents. This has resulted in a scarcity of medical facilities and products, especially at the primary health or community level. Even though medical product procurement, use, and management must be done with care, a lack of products and facilities such as PPEs can exacerbate the surge in infections; the case of China's Wuhan city (Guan W.J. et al, 2019).

Another hurdle while implementing COVID-19 preventive measures is inadequate resources to execute public health and social policies. Insufficient funding, incorrect resource distribution, lack of motivation, all contribute to a lack of resources (Yazdani & Wells, 2018). Lack of resources complicates the establishment of coronavirus isolation wards or treatment facilities, as well as the provision of critical care to patients suffering from the most severe cases of COVID-19, and the procurement and distribution of logistics to implement prevention protocols. COVID-19 infected cases may place tremendous strain on hospitals and critical care institutions, some of which may lack the necessary resources or staff to deal with the situation (Remuzzi & Remuzzi, 2020).

Despite the general awareness around the COVID-19 prevention protocols, there is the challenge of lack of cooperation among the populace which may make it difficult to strictly and consistently enforce the WHO restrictions. If WHO regulations are not followed correctly, the COVID-19 pandemic will contribute more to public hazards resulting in more transmissions and deaths (Wilder-Smith, 2020; Kohli, 2020). The lack of cooperation may translate into a poor dedication to safety by the public, even though the awareness and general knowledge of the WHO regulations expected an increase in the public's commitment to safety (WHO Coronavirus disease 2019 (COVID-19) situation report, 2020).

Communication and language challenges also impede the smooth implementation of prevention protocols. Communication in all stages of the healthcare process is essential to patient care, especially in sharing patient information and discussing treatment (Coiera, 2006). Poor communication has an impact on all elements of healthcare, including teamwork, leadership, and workplace culture. Institutions with good communication methods can improve their patients' health, whilst those without effective procedures can harm their patients' well-being (Wilder- Smith, 2020). To halt the spread of COVID-19, health care experts and organizations must grasp the importance of communication in the health care sector. Furthermore, effective communication between health advisors and the general public in a language they can easily understand will encourage people to be aware of COVID-19 and to take appropriate precautions to prevent its transmission (Kholi, 2020).

2.8 Summary

The literature review chapter explored relevant literature on the implementation of the COVID-19 prevention protocols in health facilities. It recognized the various prevention protocols as outlined by the WHO as well as guidelines by the government of Ghana. It also highlighted the various factors that affect adherence to the prevention protocols in health facilities notably; socio-demographic factors, healthcare worker-related factors, non-healthcare worker- related factors as well as facility-related factors. It then discussed the inherent challenges of implementing the COVID-19 prevention protocols. The review revealed a large gap in implementation assessment for the prevention protocols, especially in district hospitals as it was nearly impossible to come across literature or similar studies that have looked at the implementation of COVID-19 prevention protocols in district hospitals in Ghana.

CHAPTER THREE: METHODOLOGY

3.1 Introduction

The chapter describes the methods that were used in conducting the study. The chapter comprises the research design, study location, study population, inclusion and exclusion criteria, sample size and the sampling techniques, data collection approaches, study variables, and the steps by which data was analyzed and interpreted.

3.2 Research Design

The study employed a hospital-based cross-sectional study design involving quantitative and qualitative approaches to gather data for the assessment of the implementation of COVID-19 prevention protocols in selected health facilities. The study design is appropriate as it enables data to be collected on individual characteristics at a point in time, alongside information about the outcome, and the association between individual characteristics and the outcome of interest (Setia, 2016). The cross-sectional study design is used because it is simple and less expensive in terms of time and resources.

3.3 Study Location

The study was conducted in the Kassena Nankana Districts located in the Upper East Region of Ghana. The researcher chose to study KND because it was one of the districts in the region that had upsurge of COVID-19 cases in 2020 (Bolgatanga Regional Health Directorate., 2020). Also, no study had been conducted in the district to assess the implementation of the COVID-19 prevention protocols even though the Navrongo Health Research Centre and the DHMT had done a number of educational campaigns in the district. The vegetation of the

study area is guinea Savannah with a short rainy season from May to September and a prolonged dry season for the rest of the months. The area has an annual mean rainfall of approximately 1300 mm with mean monthly temperatures ranging from 22.88^{o}C to 34.48^{o}C (Oduro et al., 2012). Economically, the people in the study area are engaged in petty trading, agriculture, and tourism. The study district was selected purposively because it is a surveillance area of the Navrongo Health and Demographic Surveillance System (NHDSS) managed by the Navrongo Health Research Center (NHRC). The surveillance area is sectioned into five geographic zones (East, West, South, North, and Central) based on proximity and language. This study focused on the East and West zones (the municipal hospital and the Paga Health Centre which is now the district hospital in the west zone) of the district because the two zones are representative of the five zones, and also because of time limitation to complete work.

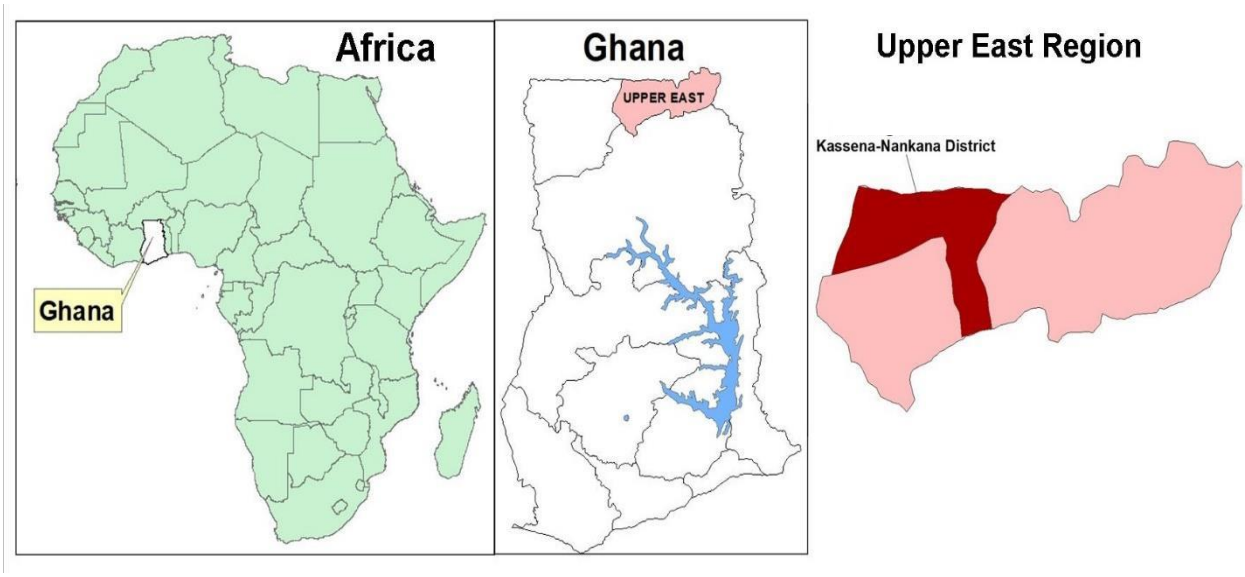

Figure 3. 1: Setting of the study area on a map of Upper East, Ghana, and Africa

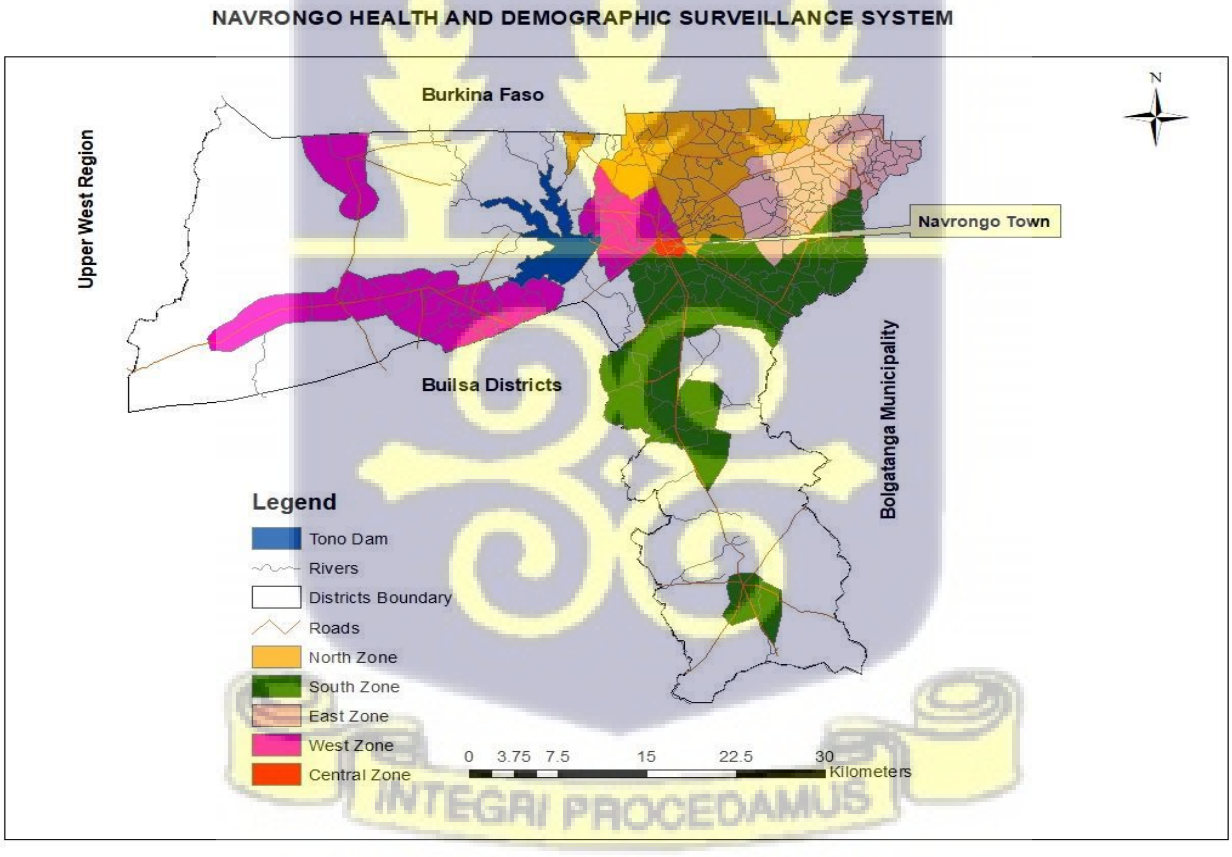

Figure 3. 2: Navrongo HDSS coverage area in the Kassena-Nankana districts

3.3.1. Health infrastructure of the Kassena-Nankana Districts

The study area has one hospital that serves as a referral facility. In addition to the hospital, there are seven health centers of which one in the West is now a hospital, with 27 CHPS compounds with resident health workers, and several other primary health care clinics. The two hospitals in the district (War Memorial Hospital in the east and Paga District Hospital in the west) are the two major referral facilities in the Kassena Nankana districts. The two facilities are managed by the District Health Management Team (DHMT) in the west and the DHMT in the east. Both east and west get their health information from the facilities and the community radio (Oduro et al., 2012). The health infrastructure of the KNDs is largely influenced by the research activities of the Navrongo Health Research Centre NHRC). NHRC is a research institution in the district whose research activities over the years have brought great improvement to the health situation of the district. Many residents in the district have built trust in the work of the Research Centre. It is because of this trust relationship that the center has a moral imperative to act especially in times of health emergencies and misinformation. One of the projects currently being run at the NHRC is the H3Africa Community Engagement in Biobanking and Genomics (CEBioGen) project funded by the United States National Institutes of Health (NIH). The overall aim of the project is to identify effective community engagement strategies for genomics and biobanking in Africa. As a community engagement project within a health research institution, the CEBioGen team collaborated with the DHMT of the East and West zones of the district to conduct some COVID-19 educational campaigns including roadshows, radio discussions, and van announcements. These campaigns became the major educational intervention of the district in demystifying misconceptions around the COVID-19. There were also instances of donation of personal protective equipment (PEs) to the two major facilities and further health education within the facilities. The collaboration aimed to demystify misconceptions around the COVID-19 and also allow researchers to educate the community on the prevention protocols as well as the advent of possible vaccines. Following the education and intensity of campaigns in the

district, it will be interesting to see how the education affected compliance and adherence and how the donations supported the facilities to implement the prevention protocols.

3.4 Target Population

The target population of the study was healthcare workers and users of health facilities within the two hospitals during the period of observation.

3.5 Study Population

The study population included health workers and non-healthcare workers (patients and their relatives) in the two health facilities. The Paga District Hospital (PDH) and the War Memorial Hospital (WMH) were also assessed. Healthcare workers including nurses, doctors, managers, or facility leaders were also observed and interviewed to answer objective four (4) of the study.

3.5.1 Inclusion criteria

To participate in the study, a potential participant had to:

- Be any person within the selected facility at the period of observation including in-patients (for the observation)
- Be eighteen (18) years and above, who have either come to receive care or brought someone receive care and has been successfully observed, (for the exit survey)
- A health worker at the facility either in the ward or out department
- Go through the informed consent process and voluntarily agree to participate in the survey. For the qualitative arm, a health worker including managers or facility unit head had to be available and willing to grant an interview.

3.5.2 Exclusion criteria

The inclusion criteria were as follows:

- Any person within the health facility in visible pain or an emergency at the period of observation
- A person 18years and above who received care from the facility but is not sane
- A potential participant who did not show an understanding of the study after going through the consent process was disqualified even if such a person voluntarily agreed to participate.
- Again, a health worker or manager, or facility in-charge who declared willingness or availability but whose attention was needed for other important issues at the facility was allowed to exit the interview at that particular time.

3.6 Sample Size

The sample size was determined using single population proportion formula considering the following statistical assumptions:

Confidence level (Cl), 95%

Proportion = 50% (50% proportion is used because the proportion of adherence to COVID-19 prevention protocols among facility users is unknown).

The margin of error is 5%

Using the following single proportion formula:

$$n = \frac{(Za/2)^2 \times P\ (1-P)}{(W)^2}$$

Where,

n = initial sample size

Z = 1.96, the corresponding Z-score for the 95% CI P =

Proportion = 50%

W = Margin of error = 5% = 0.05

$$n = \frac{(1.96)^2 \times 0.5\ (1-0.5)}{(0.05)^2}$$

n = 384

Based on the fact that the study was to be conducted in two selected facilities, the sample size of 384 was used to sample non-healthcare workers for exit surveys in the two selected facilities. It implied that the daily attendance of the two facilities had to be added and averaged in respect to the calculated sample size to determine how many surveys will be carried out in each of the two facilities.

The average daily attendance to the WMH is about 120 as reported by the administrator while that of PDH is 55. Adding the two figures gives a total of 175.

Calculating the proportion for each facility, We

had for WMH;

120÷175×384= 263

For PDH, we had a sample of;

55÷175×384= 121

By considering a 10% non-response rate for each facility, WMH expected a minimum sample of 289 surveys and PDH expected a minimum sample of 133. In all, the study expected to conduct a minimum of 422 surveys with non-healthcare workers in the two facilities.

3.7 Sampling Techniques

3.7.1 Quantitative

A consecutive sampling procedure was used to sample participants for the exit survey. This sampling approach was chosen because there was no available list of non-healthcare workers and the researcher

could not tell beforehand those who will be visiting the health facilities of the study area, to make randomization possible. Also, with the consecutiveience sampling technique participants were selected in the health facility (PDH and WMH) based on availability and willingness to take part in the exit interviews during the period of observation till the desired sample size was reached. The same respondents were followed till their exit interviews to determine adherence to COVID-19 prevention protocols. While the advantages of consecutive sampling cannot be overemphasized, the fact that it is prone to bias was well noted and the researcher intentionally enforced the inclusion and exclusion criteria, while ensuring a balance between males and females during recruitment (Etikan, 2016).

3.7.2 Qualitative

A purposive sampling technique was used to select the participants for the study. Considering that healthcare workers in the facility setting usually have a lot of pressure and work burden, the study purposively sampled the ward or unit in-charges (male ward, female ward, OPD, laboratory, kids ward, emergency ward, COVID-19 ward, head of security) who were available and willing from the two facilities for the qualitative interviews. The researcher focused on the actual implementers of the prevention protocols in the units within the facilities (Stojan et al., 2016).

3.8 Source of Data

A comprehensive literature review was conducted to augment the primary data that was gathered from the facilities through the administration of the exit survey, interviews, and observations.

3.9 Methods of Data Collection

A mixed-method approach involving the use of both qualitative and quantitative methods was used for data collection. The study conducted four data collection activities within each facility visited.

3.9.0 Pretest of data collection tools

The testing of the data collection tools was done in Sandema district hospital to detect inconsistencies and other problems that may arise during data collection. This process was also to establish validity and reliability.

3.9.1 Facility Assessment

Each hospital was assessed for the availability of COVID-19 prevention materials using an observation checklist to mark the availability and functionality of COVID-19 prevention materials including veronica buckets with soap, water, tissue, dust bins at vantage points for disposing of used tissue, hand sanitizers, available cue to action at vantage points to remind people to adhere including loud posters and comprehensible signs, spaces with demarcated seats for social/physical distancing, and rules that return healthcare workers and non-healthcare workers who do not wear a mask or wash their hands. The observation checklist for the facility assessment was developed with the CDC's guidelines and standards for health facilities during the COVID-19 pandemic and administered to the various units of the facilities. Unit by unit, the researcher assessed the availability of these prevention materials as against the CDC standards.

3.9.2 Observation of facility users; healthcare workers and non-healthcare workers

The researcher directly observed all persons in the facility including healthcare workers in the ward and those at the OPD using a checklist designed in Open Data Kit (ODK). The researcher also observed non-healthcare workers including inpatients and their caretakers, and outpatients. The broad categories of observation were the healthcare workers and non-healthcare workers since the focus of the study was to use adherence to COVID-19 prevention protocols to assess the implementation of the protocols in health facilities which are mainly used by healthcare workers and non-healthcare workers. Again, the focus of

the study was the health facility that deals with outpatients and inpatients hence, the researcher observed compliance and adherence in the wards and whether it was any different from the users at the OPD.

The observation period was four days for each facility and usually started at 7:00 am till about 2:00 pm when the facilities no longer had many people at the departments. The researcher believed observing for four days within the hours of 7:00 am and 2:00 pm gives a true reflection of what is actually on the ground than the initial plan of observing for a day. While including more days for observation could have produced a much better reflection of the ground situation, the researcher had time and other constraints which further heightened the choice of observing each facility for four days.

The researcher observed the male ward, the female ward, the emergency ward, and the pediatric ward of the two facilities for the inpatient category. The researcher however added the maternity ward in the Paga District Hospital as it stands so close to the pediatric ward and was visibly busy at the time of field visits. The male and female wards were observed to give a fair balance between the sexes of the population even though the wards produced a different number of observations at the end of the day depending on the number of in-patients, caretakers, and healthcare workers in the ward at the time of observation, while the pediatric ward was observed to see how healthcare workers and caretakers were protecting the young children against the virus.

The OPD, records, pharmacy, and laboratory departments of both facilities were also observed for the outpatient category. The observation checklist was designed according to the WHO standards for wearing a nose mask, social/physical distancing, and washing hands (WHO, 2020d). Two data collectors were trained to help the researcher conduct the observation.

3.9.3 Quantitative Survey

After the facility assessment and during the period of observation, the calculated sample for each of the facilities was used to recruit qualified non-healthcare workers for an exit survey. Exit interviews allowed the users of the facility to recount their experiences and challenges they faced while at the facility in trying to observe the prevention protocols (Aujla et al., 2021). An exit survey is appropriate for this study because it eliminates recall bias in terms of users narrating their challenges and reduces the fear of being victimized that non-healthcare workers usually have when they are being interviewed within the facility setting (MILLER FRANCO et al., 2002).

To successfully conduct the exit survey under the current circumstances of the COVID-19 pandemic, data were collected using a pretested, structured, electronic interviewer-administered questionnaire designed in Open Data Kit (ODK). The importance of e-data cannot be overstated. The survey tool was adapted from a similar study in Ethiopia (Azene et al., 2020).

The questionnaire was written in the English language and comprised mainly close-ended and a few open-ended questions. These questions were divided into dimensions such as socio- demographic, non-healthcare worker-related factors, health facility factors including challenges with adherence to COVID-19 prevention protocols. Six data collectors were trained to know the objectives, the relevance of the study, and the rights of the respondents either to participate or decline, to prepare them to help the researcher with the data collection.

3.9.4 Qualitative (IDIs)

Face-to-face in-depth interviews were conducted with healthcare workers including nurses, unit heads, facility managers, and security guards. An interview guide was developed and interviews were conducted to ascertain the views of healthcare workers or managers on challenges in implementing the protocols. The interview questions were constructed and conducted in English. Each interview lasted for

approximately 15-55 minutes. The researcher conducted eight (8) IDIs at the WMH and Nine (9) IDIs at the PDH. As planned, the qualitative data reached a saturation point at the 5^{th} and 6^{th} interviews for the WMH and the PDH respectively but the researcher conducted three (3) additional interviews to confirm saturation of data (Guest et al., 2020). The interviews were conducted at the health facility (OPD, ward, and offices) at the participant's convenient time. With the consent and permission of the participants, the interviews were audio-recorded and notes were taken as well. All these methods and approaches gathered data from consenting individuals to answer the four research questions.

3.9.5 Variables, terms, and operational definitions

Table 3. 1: Variables, terms, and operational definitions

Study Variables	**Operational Definition**	**Data Collection Technique**
Dependent variable (Adherence to COVID-19 prevention protocols)	Adherence is one's ability to always observe the COVID-19 prevention protocols because it is the right thing to do or because you are told to do so. Adherence is measured as a nominal variable (binary) using 13variables.	Observation checklist/questionnaire

Independent variables Socio-demographic factors including - Age - Sex - Religion - educational status - occupation - Ethnicity	. Age is the complete years of life a person has had at the time of the study. Sex is categorized into male and female, and was reported. Religion was measured as a nominal variable (muslim, Christian, or traditionalist) Educational status was measured as a nominal variable (no formal education, primary, secondary, tertiary) Occupation was measured as a nominal variable (Unemployed, employed, self-employed) Ethnicity is measured as a nominal variable (Builsa, Ga-adangbe, kassem, Nankam, Sisala) These are factors that may influence facility users' ability to comply or adhere	Questionnaire and interview guide
Knowledge of COVID-19 and prevention protocols	What facility users know about the virus and the preventive protocols	Questionnaire and interview guide
Enforcement of prevention protocols	Implementers ensuring or reminding facility users about the prevention protocols	Survey and interview
Belief/perception about the virus and prevention protocols	What facility users think about the virus and the preventive protocols	Questionnaire and interview guide
Work burden for healthcare workers	Other responsibilities and workload of healthcare workers	Interview guide

Availability of materials including cue to action	Functional materials with easy access to all users that have signs to remind users to use the materials	Observation checklist
Healthcare worker	A person who has been trained to provide health services at the facility and is either a nurse, a doctor, a manager, or other supporting staff like security guards.	____
Non-healthcare worker	A person who is within the facility at a particular time either as a patient (outpatient or inpatient), or a caretaker	____ ____
Facility users	A term that refers to healthcare workers and non-healthcare workers in a facility	

Source: Author's Construct, 2021

3.10 Data Management and Analysis

3.10.1 Quantitative

Data collected were exported into Microsoft Excel format, and then imported into STATA 16 for data management and analysis. Consistency and accuracy were checked based on the flow of the questions. Also, outliers were checked and resolved. Then, a composite scoring approach was used to assess adherence, enforcement, and knowledge of participants on COVID-19 prevention protocols. Discrete variables such as the age of the participant were transformed into categorical variables based on reviewed literature.

Descriptive statistics like frequencies, percentages, and means/median were computed and bivariable analyses were carried out to examine the relationship between adherence and each of the factors using Chi-square test analysis. Individuals were adjudged by both observation and some variables in the survey to be adherent to COVID-19 prevention protocols. ll explanatory variables that were statistically significant at the bivariable logistic regression model at p-value <0.05 were included in the multiple logistic regression model to see the real determinants of adherence. Adjusted odds ratios with a 95% confidence interval were computed, and variables with a p-value <0.05 in the multivariate model were considered statistically significant. The results of the study were presented in tables and figures.

3.10.2 Qualitative

The audio-recorded data were kept on a passworded computer and copies of such were on a compact disc to serve as backup. The recorded files were transcribed verbatim in the English language from audio to text format using the Microsoft Office Word application 2019 version.

In analyzing the data, six steps method of qualitative data analysis was adapted (Creswell, 2009). The first step of this method involved data transcription. At this stage, the researcher listened to the voices over and over again to familiarize himself with the audio-recorded data before it was transcribed into text format. The second step was familiarization with the transcripts. With this step, the researcher read through all the data over and over again. This helped the researcher to get a general sense of the overall meaning of the data from the perspectives of the participants. This exercise created the opportunity for the identification of codes and themes.

The third step involved coding where the researcher organized the material into segments to bring meaning to the information. These segments were labeled with codes developed in the NVivo12 software that described the data at different levels with emerged themes. The fourth step was the development of themes. The researcher developed themes that appeared as major findings and

exported the various codes to these themes that were used to create headings and subheadings in the presentation and discussion of data. In respect of the last but one step, data were described-meanings and clarifications were made from the data in respect to the subject matter; challenges in implementing the COVID-19 protocols.

At the final step, the researcher interpreted the meaning of the themes in line with the objectives of the study. The researcher also compared these findings with the information gathered from the literature to draw conclusions and highlight the implications of the key findings of the study. This method was useful because it helped the researcher to validate the accuracy of the information received from the participants (Creswell, 2009). Qualitative data of the study were analyzed per facility.

3.10.2.1 Triangulation

Triangulation is a strategy for ensuring the credibility and trustworthiness of research findings by incorporating several viewpoints in social science research (Yeasmin & Rahman, 2012). Concerning triangulation, viewpoints on the subject matter were sought from healthcare workers and non-healthcare workers through the various data collection activities outlined above. The researcher used various approaches to gather different perspectives from the participants with the hope to ensure the credibility and trustworthiness of the findings of this research.

3.11. Data quality control/assurance

Due to the volume of work (facility assessment, exit survey, in-depth interviews, observations for four days in each facility), six field workers and one research assistant were trained to assist the researcher in collecting the data. The Research Assistant and field workers were trained and their ability to accurately record the responses of participants was assessed. The researcher actively participated in the data collection and supervision of the data collection. To ensure the

confidentiality of responses and reduce the risk of incomplete submissions and missing data, there was a two-level submission of data. Firstly, field workers filled out responses on their electronic devices and submitted them to the research assistant for verification, and then an onward submission was made to the researcher. The researcher checked the data before it was finally submitted to the researcher's password-protected google drive. Some completed surveys were randomly selected and re-administered by the researcher to ensure the accuracy of the data collected.

3.12 Ethical Considerations

3.12.1. Ethics approvals and permissions

Ethics approval was obtained from the Ghana Health Service Ethics Committee (***GHS-ERC: 024/05/21***). Written permissions were also sought from the regional director of health services, the district director of health, and the facility-based authorities. A copy of the research proposal and an introductory letter were sent to the management team and feedback was obtained before the commencement of the study. Available and willing non-healthcare workers and healthcare workers were taken through an informed consent process to seek their permission and approval. Permission was also obtained again from the selected health facilities Hospital Management Team (HMT) on the commencement days. The researcher also wrote letters of appreciation to the facilities after completing data collection.

3.12.2. Informed consent

Informed consent forms which contained information about the study, purpose, recruitment procedure, potential risks and benefits, and assurance of privacy and confidentiality were administered to each potential research participant before the study. Only those who understood the information and voluntarily gave consent by signing the form participated in the study.

3.12.3. Privacy and confidentiality

All the information collected from the study is well kept on a password-protected personal computer of the investigator and shall not be shared with non-study team members or used for any other purpose except this academic work. The names of the participants were not recorded to ensure anonymity.

3.12.4. Risks and benefits

Participants were informed that there was minimal risk for participating in the study which included their time and energy. Participants were also informed that there was no direct benefit for taking part in the study, however, findings from the study based on the information they will provide would be used for policy formulation to address the challenges in implementing the COVID-19 protocols and improve implementation.

3.12.5. Voluntariness

Participants were informed that participation in the study was strictly voluntary and if an individual chose not to participate, that would not in any way affect their hospital care services for this reason the principal investigator chose the exit survey. Also, participants were informed about their right to withdraw from the study at any point after their initial acceptance to participate in the study or skip any questions they do not feel comfortable answering.

3.12.7. Funding

This research was funded under the H3Africa CEBioGen project under a grant from the United States National Institutes of Health/National Human Genome Research Institute (NIH/NHGRI).

3.12.6. Conducting research under COVID-19 measures

Considering the current COVID-19 pandemic, the investigator ensured that participants, as well as potential participants who the team contacted for the exit surveys, were provided with a CEBioGen branded or surgical nose mask before interacting with them. A safe distance that did not compromise the privacy of participants was also observed during interviews. The researcher and team members usually introduced themselves and the study by beginning with a little education about the COVID-19 pandemic. Potential participants were then taken through the consent process after sanitizing their hands with the hand sanitizer that was provided by the researcher. The research team used electronic devices on which the survey tool was designed in ODK, operated by team members to reduce the risk of possible transmission from handling paper questionnaires. Both participants and research team members sanitized their hands at the end of the survey.

For the qualitative interviews, the interviewer and the participant both wore nose masks provided by the researcher and sanitized their hands. The recorder was then placed close to the participant to capture the responses while the interviewer sat at a reasonable distance (1meter apart) such that the privacy of the participant and their responses were not compromised. Both parties sanitized their hands at the end of the interview including the recorder before the interviewer exited the venue.

CHPATER FOUR: MONITORING AND EVALUATION ISSUES

4.1 Introduction

The chapter describes the monitoring and evaluation issues of the study. It comprises the description and concept of the program or process that is being evaluated, the activities and components of the program, the type of evaluation, the logical framework of the study, and a table of indicators and their measurement.

4.2 Description/concept of the program

Since December 2019, health systems around the world have struggled with the effects of the COVID-19 pandemic which continues to cause morbidity and mortality among the world's population. Businesses, education, and livelihoods have had devastating interruptions with acute losses that have worsened the effects of the pandemic around the world (Apanga et al., 2021).

In Africa, the advent of the pandemic has caused many countries to develop systems to support real-time surveillance and immunizations to improve the resilience of the health systems to effectively respond to the outbreak (Ihekweazu & Agogo, 2020).

In response to the pandemic, the WHO and the CDC have recommended strategies and practices to reduce the spread of the virus and the effects of the coronavirus disease. Behavioral change and vaccinations in the present time continue to be the way to curtail the spread of the virus. With the advent of vaccines and appeals for all to be vaccinated, the CDC has stated emphatically that a person who obtains a COVID-19 vaccine should continue to observe the safety protocols to prevent breakthrough infections (CDC, 2020b). Healthcare workers and patients at the facilities are at risk of either contracting or transmitting the virus. In several instances, lack of knowledge, poor

adherence, and compliance with the preventive measures of the infectious disease implicate rapid spread of the infection and also put both the patient and health worker at high risk (McCloskey & Heymann, 2020). While the government of Ghana adopted and promoted the safety precautions for the Ghanaian population, ("Coronavirus," 2020), the upsurge of infections across various districts leaves much to be desired (Bonful et al., 2020; Ghana Health Service, 2020). This situation could be linked to the inability of the population to follow the safety precautions religiously (OConnell et al., 2020). This breeds a research interest to understand how well the protocols are implemented and how well right behavior including social distancing, wearing a nose mask in a public setting, and proper hand hygiene is being enforced in health facilities (CDC, 2020a). In this regard, the COVID-19 pandemic offers a unique opportunity to assess the implementation of COVID-19 prevention protocols in selected health facilities and explore the challenges in implementing the COVID-19 protocols during this peak period.

4.3 Type of evaluation

This was a process evaluation of the implementation of the COVID-19 prevention protocols in selected health facilities in the Kassena-Nankana District of Ghana. This process evaluation was conducted to determine whether health facilities programs for COVID-19 prevention were being implemented as planned and whether they were achieving the desired results of effectively ensuring adherence to prevention protocols among healthcare workers and non- healthcare workers. It was also to check the extent to which facilities were prepared in terms of making available protocol materials and whether the implementation efforts reached the targeted population largely healthcare workers and non-healthcare workers in the facilities (Limbani et al., 2019; *Types of Evaluation*, n.d.).

4.4 Logical framework

Table 4. 1: Logical framework for assessing the implementation of COVID-19 prevention protocols in health facilities

Narrative	Objectively Verifiable Indicators (OVI)	Means of Verification (MOV)	Assumptions
Goal • Assessment of adherence to COVID-19 prevention protocols in health facilities	• % level of adherence to protocols in facilities	• Survey • Observation/checklist	
Impact • Willingness/refusal to adhere/comply with prevention protocols	• number of patients and healthcare workers who attempt/refuse to comply/adhere	• Observation/survey	• Research interest • Enabling environment
Outputs • Reminders to NHCW/HCW to follow protocols • Access and use of protocol materials	• # of NHCW reminded to follow protocols • # of NHCW/HCW that see and use available PPEs	• Survey • Observation • Observation/checklist	• All materials are available at all points and time

• Demonstrated knowledge of protocols	• # of NHCW that score ≥8 in knowledge questions	• Survey	• Cultural and religious beliefs addressed
Activities			
• Provision of protocol materials and cue to action	• # of prevention protocol materials and cue to action on display	• Observation/checklist	• Available funding
• Health education on COVID-19 and the need to observe prevention protocols	• # of COVID-19 health talks held at facilities and radio	• Survey and IDI	• NHCW understand education given

Source: Author's Construct, 2021

4.4.1 Narration for the logical framework

The Logical Framework is a four-by-four matrix used to establish a relationship between the inputs through to the goal of the study. It depicts a vertical and horizontal relationship of all players of a project or research. It shows an if-and-then relationship that allows the researcher to logically think through the problem they are trying to solve. In table 4.1 above, the inputs of health education can be measured by asking questions at the facility about their health educational activities around the pandemic and the need for the observation of the prevention protocols. The NHRC/CEBioGen also did some education on the radio. This input leads to the output of patients demonstrating knowledge of the protocols and why they observe them, under the assumption that the patients understood the education or information about the virus and the protocols shared with them at the facility or radio, and that their cultural and religious beliefs that usually affect the education were addressed. Going through an if-and-then linkage using the input of health education, if there is

health education and the assumption that people understand the information shared, then it would lead to patients demonstrating knowledge of the protocols and if patients demonstrate knowledge of the prevention protocols and there are available materials to practice them, then it produces a willingness/refusal to comply or adhere and if there is a willingness/refusal to comply with protocols, and there is an interest to understand the situation, then it leads to the goal of an assessment of adherence to COVID-19 prevention protocols. A similar if-and- then relationship works for the rest of the inputs. Vertically, the inputs should directly produce the outputs, the outputs produce the impact and the impact leads to the goal.

4.5 Definition of indicators and measurement

Table 4. 2: Definition of indicators and measurement

Objective	Indicators	Numerator	Denominator	Definition	Means of measurement
Objective 1: To assess the adherence to COVID-19 prevention protocols among HCWs/NHCWs in selected health facilities	% level of adherence with COVID-19 prevention protocols	Number of participants with adherence	Total number of participants	Facility users in the premises of the facility during the period of observation.	Survey/Observation
Objective 2: To assess the availability of COVID-19 prevention protocols materials at vantage points in health facilities	# of COVID-19 prevention protocols and cue to action at display in the facility at the observation period	N/A	N/A	The number of handwashing outlets, soap, hand sanitizer, benches for social distancing,	Observation

				posters, and other cues to action on display. Stock in store is not covered under this indicator	
Objective 3: To determine the factors influencing the adherence to COVID-19 prevention protocols among non-health workers	% non-healthcare workers who demonstrate knowledge of COVID-19 prevention protocols	Number of NHCW in the study with adequate knowledge	Total number of NHCW in the study	These are the factors that are found ro influence level of adherence	Survey
Objective 4: To explore views on challenges in implementing the protocols	Number of challenges raised during the discussion with implementers	N/A	N/A	These views are challenges that make it difficult to enforce protocols	IDI

Source: Author's Construct, 2021

CHAPTER FIVE: RESULTS

5.0. Introduction

This chapter presents the key findings from the study. It comprises the results from the survey with non-healthcare workers used to answer research objectives one and three, the facility assessment and observation of facility users to answer research objectives one and two, and the key challenges that impede the implementation of COVID-19 prevention protocols in the Kassena Nankana Districts to answer objective four.

5.1 Socio-demographic characteristics of study participants

A total of 422 participants were interviewed for this study. The median age was 30 years, with the 25th percentile of 24 years and the 75th percentile of 37 years. The majority of the respondents 164 (38.9%) were within the age range of 20-39 years. A greater fraction of the participants 252 (59.7%) were females. Most of the respondents 145 (34.4%) had a secondary level of education (SHS) and about 280 (66.4%) of the respondents were married. Of the 422 participants, a greater proportion of 180 (42.7%) were self-employed. Other background information gathered includes the ethnicity and religion of participants. Details of their socio-demographic information are shown in Table 5.1.

Table 5. 1: Socio-demographic information of participants

Characteristics	N (%)	War Memorial Hospital (N=287)	Paga District Hospital (N=135)
		n (%)	n (%)
Age in years			
<20	35 (8.3)	25 (8.7)	10 (7.4)
20-29	164 (38.9)	125 (43.6)	39 (28.9)
30-39	136 (32.2)	84 (29.3)	52 (38.5)
40-49	49 (11.6)	32 (11.2)	17 (12.6)
40+	38 (9.0)	21 (7.3)	17 (12.6)
Sex			
Male	170 (40.3)	120 (41.8)	50 (37.0)
Female	252 (59.7)	167 (58.2)	85 (63.0)
Level of education			
No formal education	70 (16.6)	36 (12.5)	34 (25.2)
Primary	38 (9.0)	22 (7.7)	16 (11.9)
Middle/JHS	71 (16.8)	48 (16.7)	23 (17.0)
SHS	145 (34.4)	106 (36.9)	39 (28.9)
Tertiary and above	98 (23.2)	75 (26.1)	23 (17.0)
Ethnicity			
Kassem	307 (72.8)	195 (67.9)	112 (83.0)
Nankam	67 (15.9)	55 (19.2)	12 (8.9)
Builsa	19 (4.5)	17 (5.9)	2 (1.5)
Ga-Adangbe	5 (1.2)	5 (1.7)	0 (0.0)
Sissala	6 (1.4)	4 (1.4)	2 (1.5)
Others	18 (4.3)	11 (3.8)	7 (5.2)
Marital status			
Single	124 (29.4)	94 (32.8)	30 (22.2)
Co-habiting/Married	280 (66.4)	178 (62.0)	102 (75.6)
Separated/divorced	3 (0.7)	3 (1.1)	0 (0.0)
Widowed	14 (3.3)	11 (3.8)	3 (2.2)
Others	1 (0.2)	1 (0.4)	0 (0.0)
Employment status			
Unemployed	156 (37.0)	112 (39.0)	44 (32.6)
Employed	86 (20.4)	64 (22.3)	22 (16.3)
Self-employed	180 (42.7)	111 (38.7)	69 (51.1)

5.2 Adherence to COVID-19 prevention protocols

The adherence to COVID-19 prevention protocols among non-healthcare workers is summarised in Table 5.2. Out of the 422 participants interviewed, 364 (86.3%) wore nose masks at the time of the survey. A total of 130 (30.8%) of the participants reported they were instructed to wear a nose

mask. A high proportion of the participants 353 (87.6%) wore a nose mask at arrival in the facilities. Less than half 198 (46.9%) and 156 (37.0%) of the participants washed their hands with soap and water before entering and at some point, within the facilities respectively. A low percentage of 92 (21.8%) of the participants washed their hands when exiting the facilities. About 293 (69.4%) participants reported that they used alcohol-based sanitizers to sanitized their hands within the facilities. The majority of the participants 380 (90.1%) said they avoided close contact with other people whilst in the facilities.

Table 5. 2: Proportion of adherence to COVID-19 prevention protocols among non-healthcare workers in KND

Adherence variables	N (%)	War Memorial Hospital (N=287)	Paga District Hospital (N=135)
		n (%)	n (%)
Wore a nose mask at the time of the interview	364 (86.3)	257 (89.6)	107 (79.3)
Instructed to wear a nose mask	130 (30.8)	84 (29.3)	46 (34.1)
Wore a nose mask at arrival of the facility	352 (87.6)	256 (94.1)	96 (73.9)
Wore a nose mask covering throughout the period in the facility	375 (93.3)	264 (97.1)	111 (85.4)
Instructed to wash hands in the facility	98 (23.2)	63 (22.0)	35 (25.9)
Washed hands with soap and water before entering the facility	198 (46.9)	131 (45.6)	67 (49.6)
Washed hands with soap and water within the facility	156 (37.0)	109 (38.0)	47 (34.8)
Washed hands with soap and water when exiting the facility	92 (21.80)	65 (22.7)	27 (20.0)
Sanitized hands within the facility	293 (69.4)	198 (69.0)	95 (70.4)
Instructed to observe social distancing at the facility	213 (50.5)	121 (42.2)	92 (68.2)
Avoided close contact with other people	380 (90.1)	252 (87.8)	128 (94.8)

Spaces at units were enough to observe social distancing	326 (77.3)	218 (76.0)	108 (80.0)
Seating arrangements at units were good for social distancing	313 (74.2)	204 (71.1)	109 (80.7)

5.2.1 Level of adherence to COVID-19 prevention protocols

The level of adherence to COVID-19 prevention protocols among non-healthcare workers is presented in Figure 5.1. When categorized into overall low (<50%) and High (>50%) adherence ratios at the facility level, Low adherence to COVID-19 prevention protocols was observed at 63.4% in WMH compared to 56.3% in PDH (Figure 5.1). Overall, the majority (61.1%) of the respondents' adherence to COVID-19 prevention protocols in the Kassena-Nankana District was low (Figure 5.2).

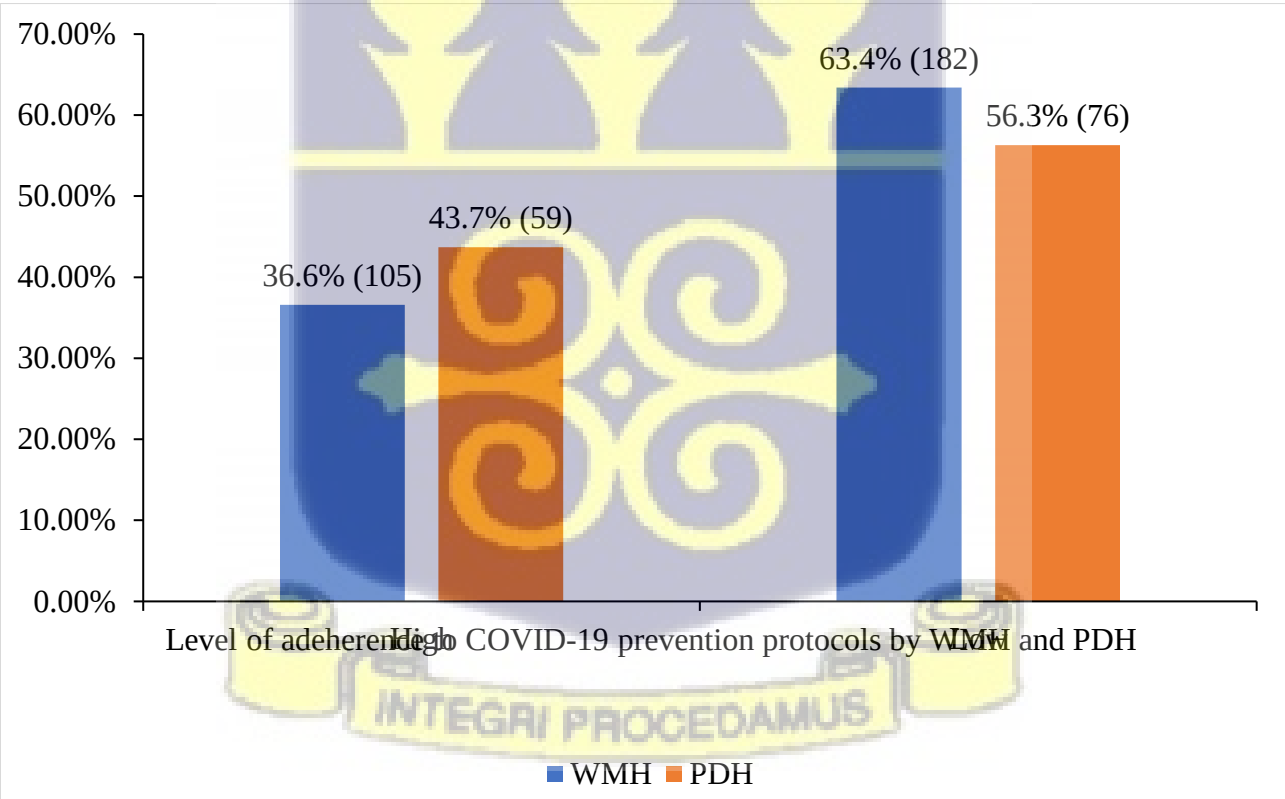

Figure 5. 1: Level of adherence to COVID-19 prevention protocols by the selected hospitals in KNM, 2021

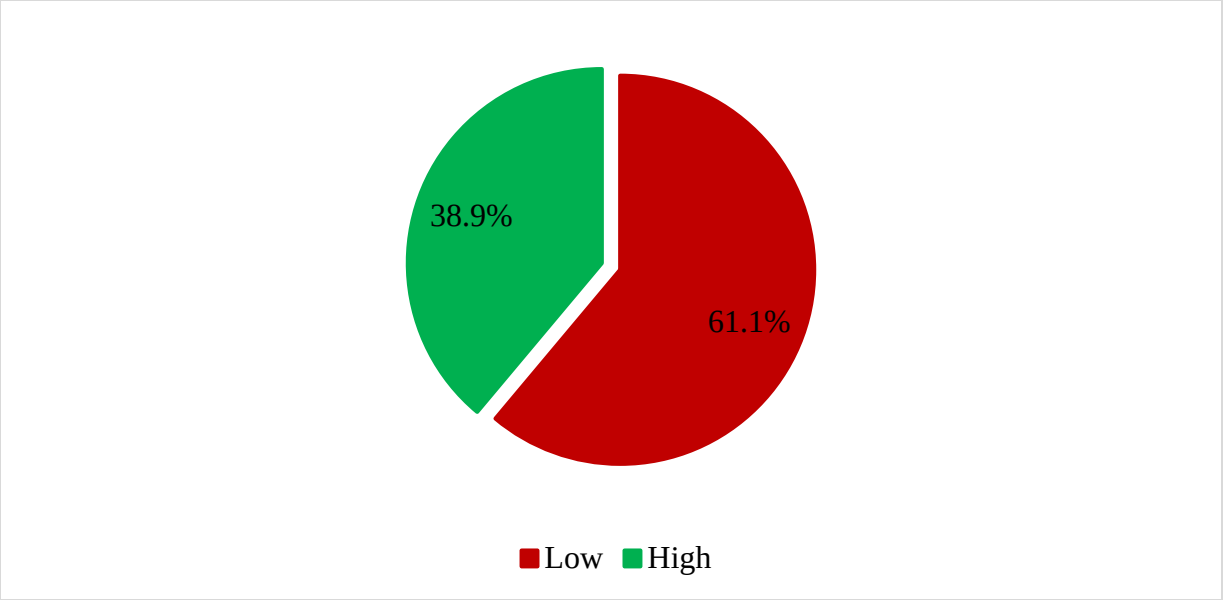

Figure 5. 2: Overall level of adherence to COVID-19 prevention protocols among non-healthcare workers in KND, 2021

5.2.2 Knowledge of COVID-19 prevention protocols

The proportion of knowledge on COVID-19 prevention protocols among non-healthcare workers is shown in Table 5.3. In general, knowledge of COVID-19 prevention measures was high. The majority of the respondents knew that handwashing or hand sanitizing 412 (97.6%), wearing a face mask 415 (98.3%), social distancing 404 (95.7%), and avoiding crowded places 346 (82.0%), covering the nose and mouth while coughing 296 (70.1%), and avoiding touching of eyes, nose, and mouth 283 (67.1%) could prevent COVID-19.

Table 5. 3: non-healthcare workers' knowledge on COVID-19 prevention protocols in KND

Knowledge about COVID-19 prevention protocols variables	Yes Response	War Memorial Hospital (N=287)	Paga District Hospital (N=135)
	N (%)	n (%)	n (%)
Handwashing or hand sanitizing can prevent COVID-19	412 (97.6)	280 (97.6)	132 (97.8)
Wearing a face mask can prevent COVID-19	415 (98.3)	285 (99.3)	130 (96.3)
Social distancing can prevent COVID-19	404 (95.7)	280 (97.6)	124 (91.9)
Avoiding crowded places can prevent COVID-19	346 (82.0)	252 (87.8)	94 (69.6)
Covering the nose and mouth while coughing can prevent COVID-19	296 (70.1)	228 (79.4)	68 (50.4)
Avoiding touching of eyes, nose, and mouth can prevent COVID-19	283 (67.1)	210 (73.2)	73 (54.1)

5.2.3 Level of knowledge about COVID-19 prevention protocols

Figure 5.3 illustrates the level of knowledge of non-healthcare workers about COVID-19 prevention protocols. The majority (60.7%) of the participants had high knowledge about COVID-19 prevention protocols (Figure 5.3). When compared to PDH (45.9%), respondents in WMH had a higher (67.6 %) level of knowledge regarding COVID-19 preventive protocols (Figure 5.4).

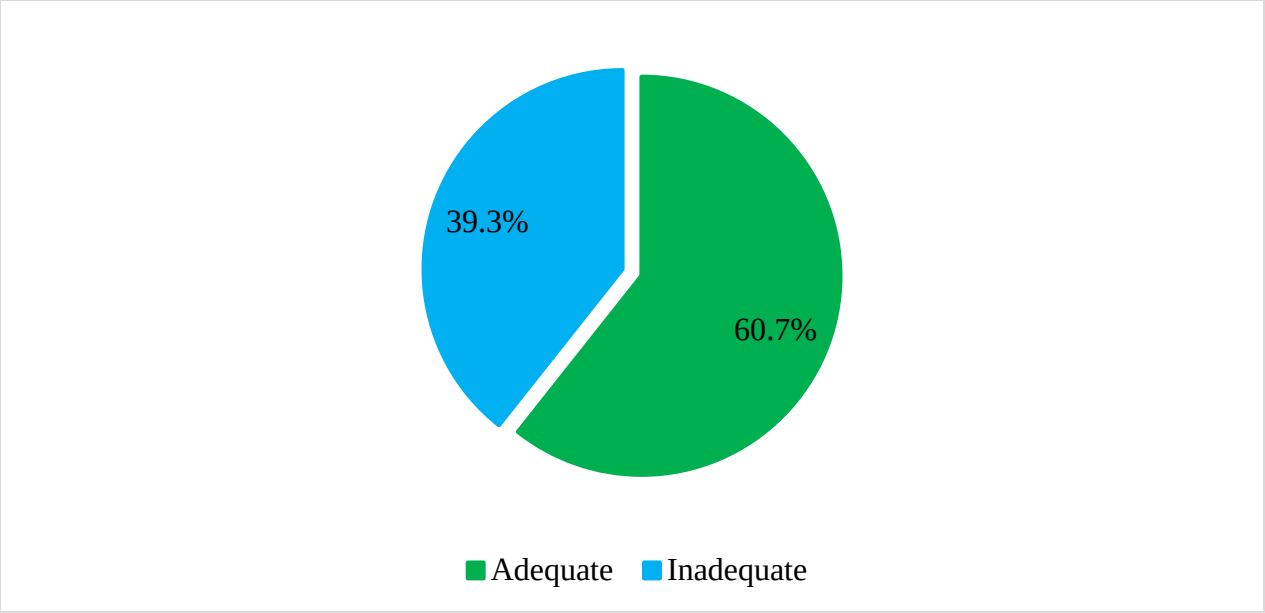

Figure 5. 3: Level of knowledge of non-healthcare workers about COVID-19 prevention protocols in KND, 2021

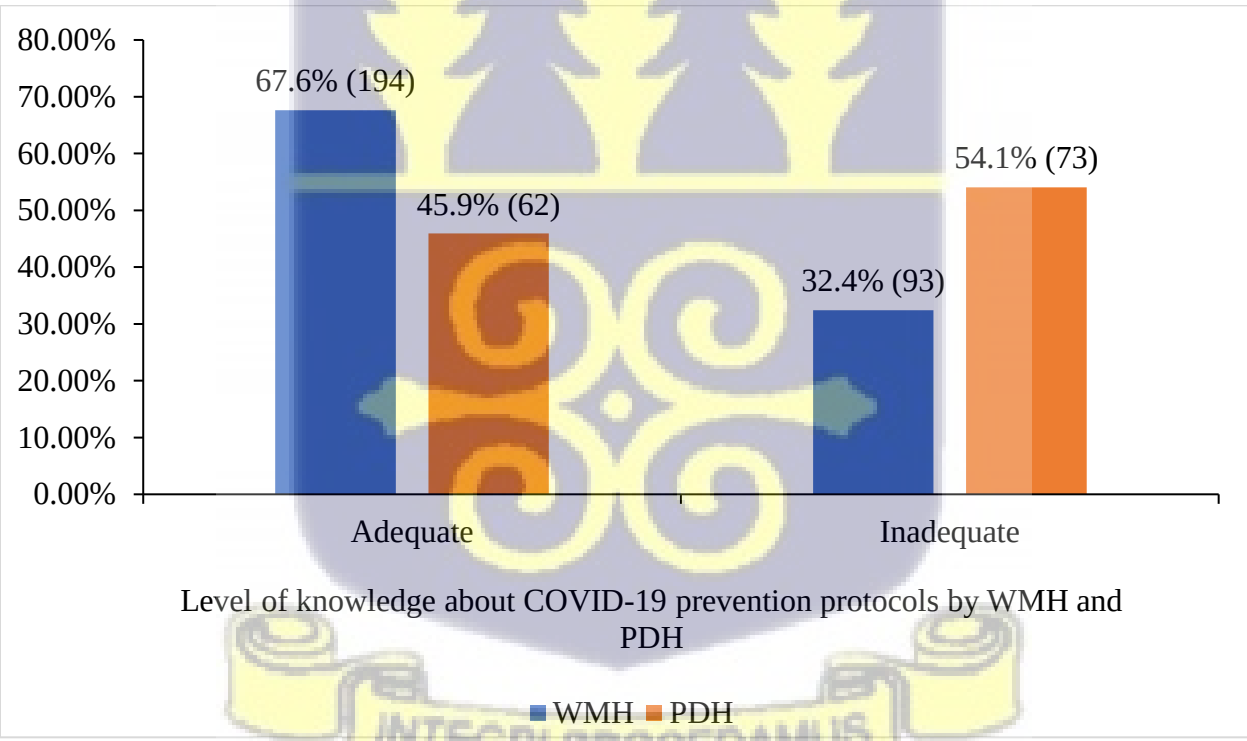

Figure 5. 4: non-healthcare workers' level of knowledge about COVID-19 prevention protocols by the selected district hospitals in KND, 2021

5.3 Availability of COVID-19 prevention protocol materials at vantage points

A total of 486 and 286 persons were observed in the War memorial and Paga hospital respectively. The majority of the observed persons were females in both hospitals (War memorial hospital=271/486; Paga hospital=143/226). A high proportion of the observed persons were non-health workers in both hospitals (War memorial hospital=382/486; Paga hospital=165/226) (Table 5.4).

Table 5. 4: Background information of observed participants within the hospital facility

Variables	Facility	
	War Memorial Hospital	Paga District Hospital
Total observation	486	226
Sex		
Female	271 (55.8)	143 (63.3)
Male	215 (44.2)	83 (36.7)
Department of observation		
OPD	142 (29.2)	43 (19.0)
Records	76 (15.6)	41 (18.1)
Pharmacy	60 (12.4)	14 (6.2)
Laboratory	60 (12.4)	20 (8.9)
Emergency	27 (5.6)	7 (3.1)
Pediatric	33 (6.8)	48 (21.2)
Male ward	64 (13.2)	16 (7.1)
Female ward	24 (4.9)	15 (6.6)
Maternity	-	22 (9.7)
Category of workers		
Health workers	104 (21.4)	61 (27.0)
Non-health workers	382 (78.6)	165 (73.0)

Observation of adherence to COVID-19 prevention protocols among HCW and NHCWs in KND

The majority of the health workers were seen in nose masks in PDH 60 (98.4%) compared to WMH 89 (85.6%). Regarding non-healthcare workers, a high proportion of 267 (69.9%) of nose mask adherence was observed in WMH as against 96 (58.2%) in PDH. Observed available space for recommended WHO/CDC physical distancing was about 18 (62.1%) of the total number of

observations in WMH compared to 8 (38.1%) in the PDH. HCWs seen using any alcohol hand rubs were high 16 (76.2%) in PDH compared to WMH 13 ((44.8%) (Table 5.5).

Table 5. 5:Observation of adherence to COVID-19 prevention protocol among HCW and NHCWs in KND

Variables	Facility	
	WMH N (%)	**PDH** N (%)
Nose mask		
HW who wore a nose mask	89 (85.6)	60 (98.4)
HW who did not wear nose mask	15 (14.4)	1 (1.60
Total	**104 (100)**	**61 (100)**
NHW who wore a nose mask	267 (69.9)	96 (58.2)
NHW who did not wear nose mask	115 (30.1)	69 (41.8)
Total	**382 (100)**	**165 (100)**
	Total Observation = 29	**Total Observation = 21**
Social Distancing		
Available space for recommended WHO/CDC physical distancing	18 (62.1)	8 (38.1)
Demarcations/stickers at department to show seating arrangement	1 (3.5)	2 (9.5)
Well ventilated waiting area at the department	24 (82.8)	14 (66.7)
Appropriate spacing between staff-on-staff table/counter	15 (51.7)	11 (52.4)
Appropriate spacing (1metre apart) between patient to patient or patient and healthcare workers $ (n=20) (n=11)	12 (60.0)	7 (63.6)
Appropriate spacing in the ward (bed to bed) # (n=9) (n=10)	6 (66.7)	6 (60.0)
HCWs are seen washing hands under running water for at least 20 seconds	5 (17.2)	8 (38.1)
HCWs are seen using any alcohol hand rubs	13 (44.8)	16 (76.2)
Non-HCWs are seen washing hands under running water for at least 20 seconds	2 (6.9)	2 (9.5)
Non-HCWs are seen using any alcohol hand rubs	2 (6.9)	0 (0.0)

#: n (WMH)=9; n (PDH)=10; $: n (WMH)=20; n (PDH)=11

5.3.1 Level of adherence to COVID-19 prevention protocols by observation among HCW

Overall, the majority of HCWs (51.7%) observed, followed COVID-19 prevention methods religiously (Figure 5.5). Compared to PDH healthcare workers (42.9 %), HCWs in WMH had a higher proportion (51.7 %) of adherence (Figure 5.6).

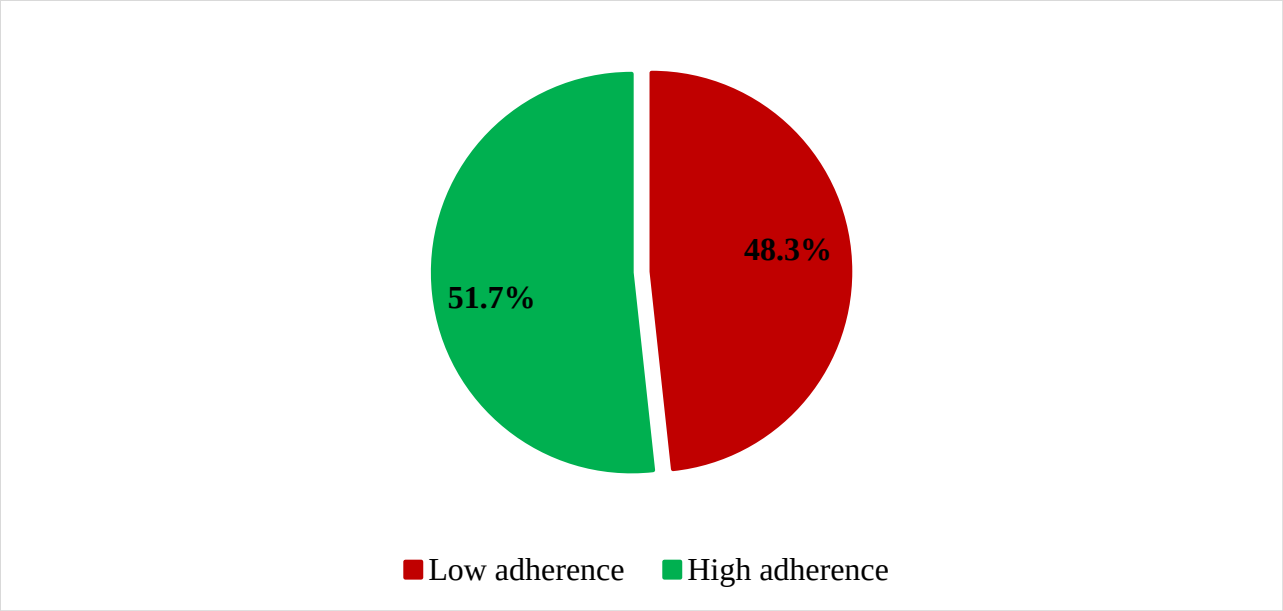

Figure 5. 5: Overall adherence to COVID-19 prevention protocol by observation among HCW

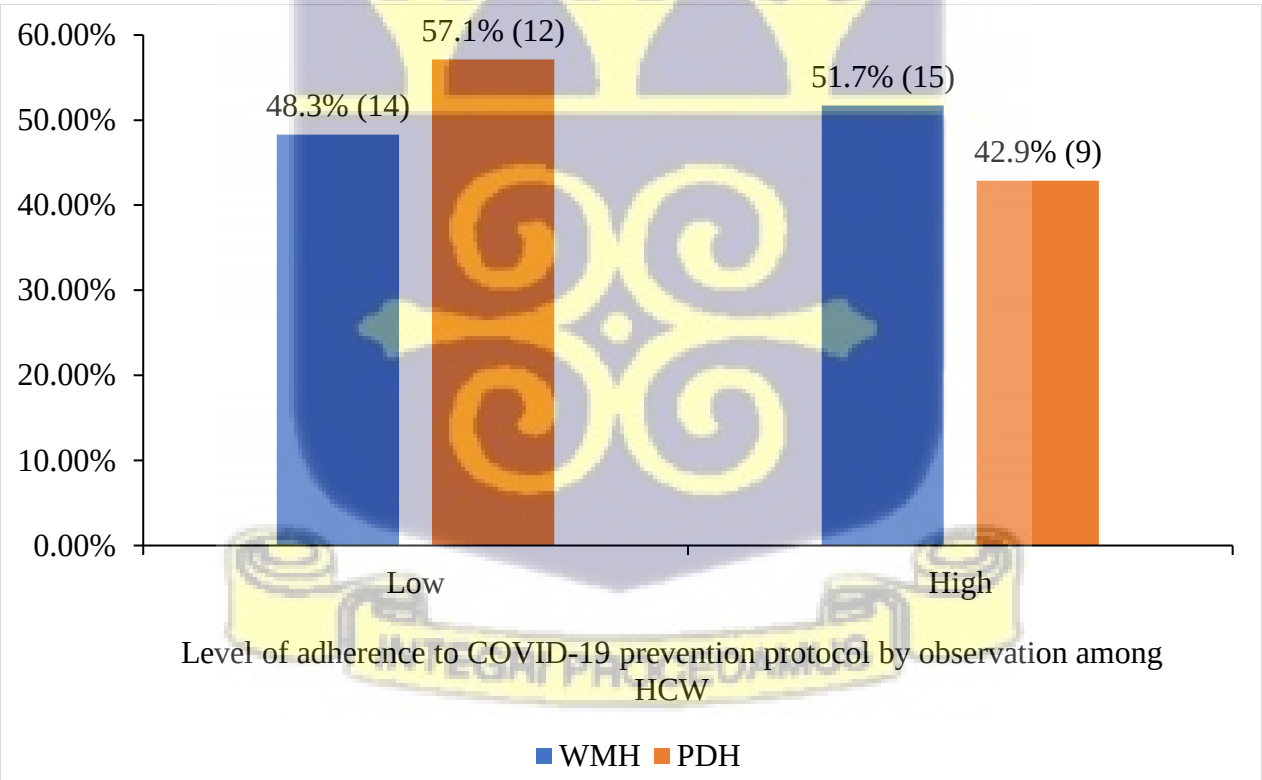

Figure 5. 6: Level of adherence to COVID-19 prevention protocol by observation among HCW

5.3.2 Level of adherence to COVID-19 prevention protocols by observation among NHCW

Regarding NHCWs, more than half (52.4%) demonstrated low adherence towards COVID-19 prevention protocols (Figure 5.7). NHCWs in PDH had high (47.6%) adherence compared with WMH non-healthcare workers (37.9%) (Figure 5.7).

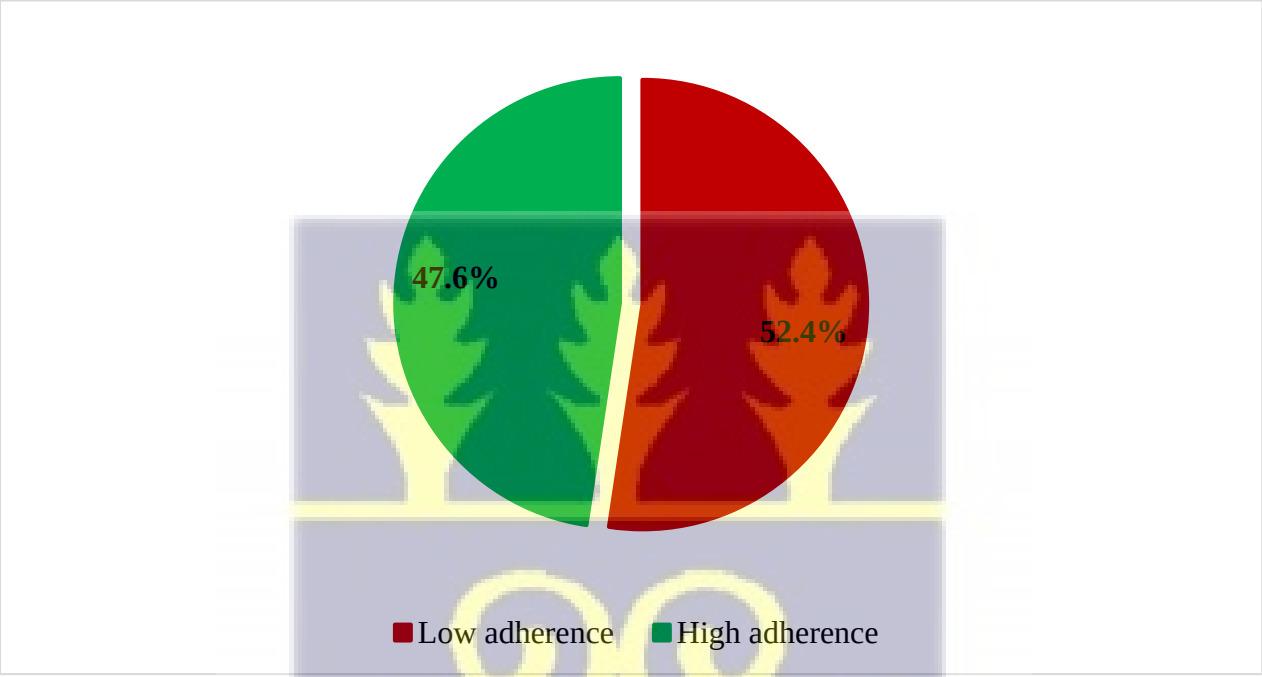

Figure 5. 7: Level of adherence to COVID-19 prevention protocol among NHCW

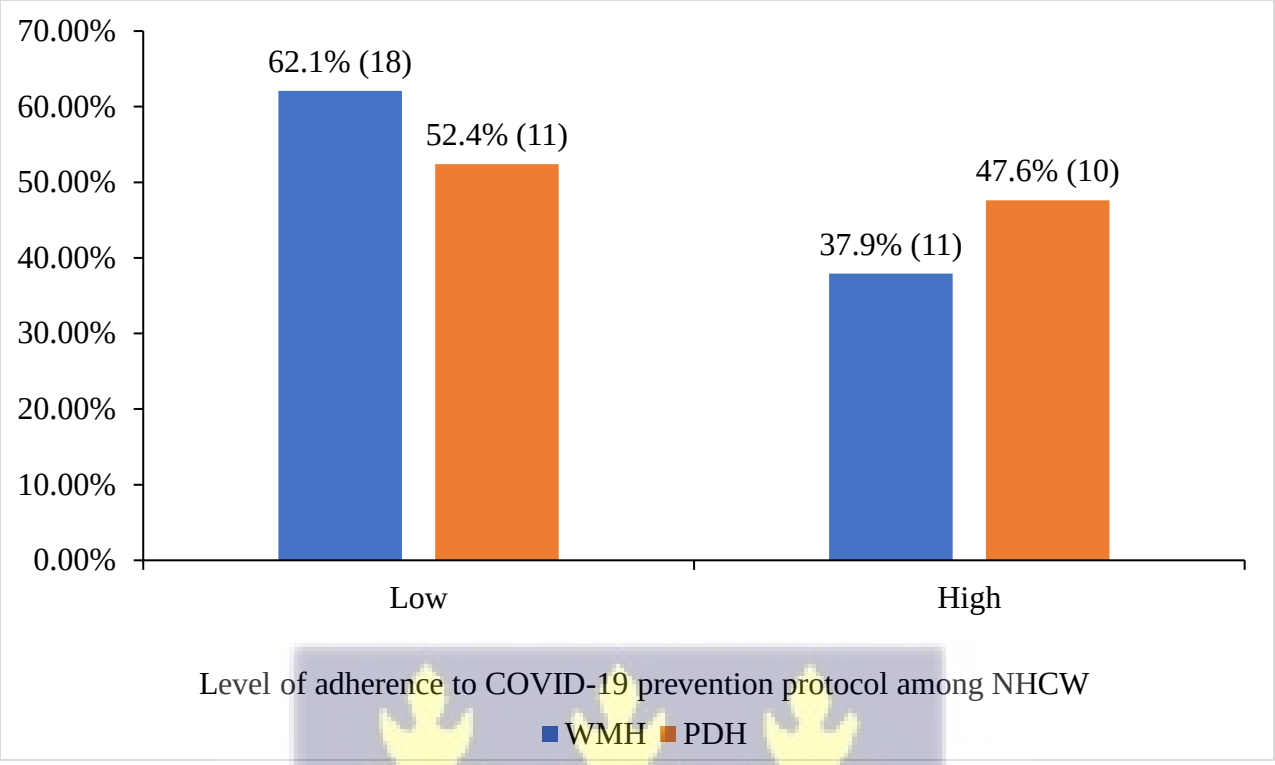

Figure 5. 8: Level of adherence to COVID-19 prevention protocol by observation among NHCW

5.3.3 Availability or non-availability of COVID-19 prevention protocol materials

Of the 29number of observations done in the WMH, functional veronica buckets were seen 8 times (27.6%). No disposable towel or tissue was observed during the 29number of observation in WMH. Soap or soap solution, dust bins, and hand sanitizers at vantage points were seen once (3.5%) during the 29number of observation in WMH. No loud reminders to practice hand hygiene were observed during the 29number of observation in WMH.

On the other hand, functional veronica buckets were seen 9 times (42.9%) during the 21number of observation in PDH. Alcohol rubs were observed on staff tables at all the times of observations. Details are presented in Table 5.6.

Table 5. 6: Observation of availability or non-availability of COVID-19 prevention protocol materials in the HFs

Variables	Facility	
	WMH N=29	**PDH** N=21
Hand washing facility (Veronica bucket or sinks)		
Available and functional	8 (27.6)	9 (42.9)
Available but not functional	7 (24.1)	4 (19.1)
Not available	14 (48.5)	8 (38.1)
Hand washing materials		
Soap or soap solution	1 (3.5)	8 (38.1)
Disposable towel or tissue	0 (0.0)	2 (9.5)
Dust bins by the washing facility	1 (3.5)	10 (47.6)
Hand sanitizers at vantage points at the unit	1 (3.5)	2 (9.5)
Thermometer guns to check the temperature at the unit	6 (20.7)	9 (42.9)
Alcohol rubs on staff table	21 (72.4)	21 (100)
Cue to Action		
Easy to understand posters at department/ward reminding facility users about COVID-19 prevention protocols	2 (6.9)	6 (28.6)
Active reminders at department premises/ward entrances to wear a nose mask	12 (41.4)	11 (52.4)
Loud reminders to practice hand hygiene	0 (0.0)	3 (14.3)

Availability or non-availability of COVID-19 prevention protocol materials by departments/wards in the WMH

Of all the departments/wards, the laboratory was the only unit with an available and functional handwashing station (Veronica bucket or sinks) for all five number of observations. Disposable towels or tissue, and loud reminders to practice hand hygiene were however not seen in any of the departments/wards during the observation. Hand sanitizers at vantage points were only observed at the OPD once during the five number of observation (Table 5.7).

Table 5. 7: Availability or non-availability of COVID-19 prevention protocol materials by departments/wards in the WMH

Variables	Departments/Wards							
	OPD N=5[1]	Records N=4	Pharmacy N=6	Lab N=5	Emergency N=2	Paediatric N=2	Male N=3	Female N=2
Hand washing facility (Veronica bucket or sinks)								
Available and functional	1 (20.0)	1 (25.0)	-	5 (100)	-	1 (50.0)	-	-
Available but not functional	2 (40.0)	-	1 (16.7)	-	1 (50.0)	1 (50.0)	2 (66.7)	-
Not available	2 (40.0)	3 (75.0)	5 (83.3)	-	1 (50.0)	-	1 (33.3)	2 (100)
Hand washing materials								
Soap or soap solution	0 (0.0)	0 (0.0)	1 (16.7)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Disposable towel or tissue	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Dust bins by the washing facility	0 (0.0)	0 (0.0)	0 (0.0)	1 (20.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Hand sanitizers at vantage points at the unit	1 (20.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Thermometer guns to check temperature at unit	5 (100)	0 (0.0)	1 (16.7)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Alcohol rubs on staff table	5 (100)	3 (75.0)	3 (50.0)	4 (80.0)	1 (50.0)	0 (0.0)	3 (100)	0 (0.0)
Cue to Action								
Easy to understand posters at department/ward reminding facility users about COVID-19 prevention protocols	1 (20.0)	1 (25.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Active reminders at department premises/ward entrances to wear nose mask	1 (20.0)	1 (25.0)	1 (16.7)	1 (20.0)	2 (100)	0 (0.0)	3 (100)	2 (100)
Loud reminders to practice hand hygiene	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)

1 number of numbers of observation

Availability or non-availability of COVID-19 prevention protocol materials by departments/wards in the PDH

At the PDH, the pediatric ward, male ward, and female ward were observed to have functional veronica buckets in most of the observation number of. Soap or soap solution was observed mostly in the male and female wards in all the number of observations. Alcohol rubs were seen on staff tables in all the departments/wards in all the number of observations. Easy to understand posters at department/ward reminding facility users about COVID-19 prevention protocols were seen at the records departments at all the times of observation (Table 5.8).

Table 5. 8: Availability or non-availability of COVID-19 prevention protocol materials in the PDH

Variables	Departments/Wards								
	OPD N=3	Records N=3	Pharmacy N=2	Lab N=3	Emergency N=1	Paediatric N=3	Male N=2	Female N=2	Maternity N=2
Hand washing facility (Veronica bucket or sinks)									
Available and functional	-	-	1 (50.0)	-	-	3 (100)	2 (100)	2 (100)	1 (50.0)
Available but not functional	3 (100)	-	-	1 (33.3)	-	-	-	-	-
Not available	-	3 (100)	1 (50.0)	2 (66.7)	1 (100)	-	-	-	1 (50.0)
Hand washing materials									
Soap or soap solution	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	3 (100)	2 (100)	2 (100)	1 (50.0)
Disposable towel or tissue	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	1 (50.0)	1 (50.0)	0 (0.0)
Dust bins by the washing facility	1 (33.3)	0 (0.0)	1 (50.0)	0 (0.0)	0 (0.0)	3 (100)	2 (100)	2 (100)	1 (50.0)
Hand sanitizers at vantage points at the unit	1 (33.3)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	1 (50.0)	0 (0.0)
Thermometer guns to check temperature at unit	3 (100)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	1 (33.3)	2 (100)	2 (100)	1 (50.0)
Alcohol rubs on staff table	3 (100)	3 (100)	2 (100)	3 (100)	1 (100)	3 (100)	2 (100)	2 (100)	2 (100)
Cue to Action									
Easy to understand posters at department/ward reminding facility users about COVID-19 prevention protocols	1 (33.3)	3 (100)	1 (50.0)	1 (33.3)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Active reminders at department premises/ward entrances to wear a nose mask	1 (33.3)	2 (66.7)	2 (100)	1 (33.3)	0 (0.0)	3 (100)	0 (0.0)	1 (50.0)	1 (50.0)
Loud reminders to practice hand hygiene	0 (0.0)	1 (33.3)	0 (0.0)	1 (33.3)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	1 (50.0)

5.4 Factors influencing the adherence to COVID-19 prevention protocols

A high proportion of low adherence to COVID-19 prevention protocols (61.54%) was observed among participants with an inadequate knowledge level on COVID-19 prevention protocols. Bivariate Chi-squared analysis shows that sex ($p=0.027$), level of education ($p=0.033$), marital status ($p=0.017$), knowledge level of COVID-19 prevention protocols ($p=0.004$), and enforcement of COVID-19 prevention protocols ($p<0.0001$) was significantly associated with the level of adherence to COVID-19 prevention protocols (Table 5.9).

Table 5. 9: **Association between factors and level of adherence to COVID-19 prevention protocols among non-healthcare workers in WMH**

Variables	Level of adherence		X^2 (p-value)
	High n (%)	Low n (%)	
Age in years			
<20	6 (5.7)	19 (10.4)	
20-29	45 (42.9)	80 (44.0)	4.85 (0.304)
30-39	29 (27.6)	55 (30.2)	
40-49	14 (13.3)	18 (9.9)	
40+	11 (10.5)	10 (5.5)	
Sex			4.89 (0.027) *
Male	35 (33.3)	85 (46.7)	
Female	70 (66.7)	97 (53.3)	
Level of education			10.52 (0.033) *
No formal education	16 (15.2)	20 (11.0)	
Primary	13 (12.4)	9 (5.0)	
Middle/JHS	20 (19.1)	28 (15.4)	
SHS	37 (35.2)	69 (37.9)	
Tertiary and above	19 (18.1)	56 (30.8)	
Ethnicity			1.48 (0.477)
Kasem	72 (68.6)	123 (67.6)	
Nankam	17 (16.2)	38 (20.9)	
Other specify	16 (15.2)	21 (11.5)	
Marital status			(0.017) [F] *
Single	24 (22.9)	70 (38.5)	
Co-habiting/Married	73 (69.5)	105 (57.7)	
Separated/divorced	1 (1.0)	3 (1.7)	
Widowed	7 (6.7)	4 (2.2)	
Employment status			0.76 (0.684)
Unemployed	44 (41.9)	68 (37.4)	
Employed	21 (20.0)	43 (23.6)	
Self-employed	40 (38.1)	71 (39.0)	
Religion			1.50 (0.473)
Traditional	6 (5.7)	9 (5.0)	
Christianity	92 (87.6)	153 (84.0)	
Islam	7 (6.7)	20 (11.0)	
Knowledge level about COVID-19 PPs			8.33 (0.004) *
Inadequate	82 (78.1)	112 (61.5)	
Adequate	23 (21.9)	70 (38.5)	
Enforcement of COVID-19 PPs			37.28 (<0.0001) *
Reminded	88 (83.8)	86 (47.3)	
Not reminded	17 (16.2)	96 (52.8)	

* Statistically significant at p<0.05; [F]: Fisher's exact test

5.4.1 Association between factors and level of adherence to COVID-19 prevention protocols among non-healthcare workers in PDH

High adherence to COVID-19 prevention protocols were observed most among participants who were reminded to adhere to the protocols (91.5%) compared to those who were not reminded (8.5%). Bivariate Chi-squared analysis shows that the participant's ethnicity ($p=0.022$) and enforcement of COVID-19 prevention protocols ($p<0.0001$) were significantly associated with the level of adherence to COVID-19 (Table 5.10).

Table 5. 10**: Association between factors and level of adherence to COVID-19 prevention protocols among non-healthcare workers in PDH**

Variables	Level of adherence		X^2 (p-value)
	High n (%)	Low n (%)	
Age in years			(0.945) [F]
<20	4 (6.8)	6 (7.9)	
20-29	17 (28.8)	22 (29.0)	
30-39	24 (40.7)	28 (36.8)	
40-49	6 (10.2)	11 (14.5)	
40+	8 (13.6)	9 (11.8)	
Sex			0.60 (0.440)
Male	24 (40.7)	26 (34.2)	
Female	35 (59.3)	50 (65.8)	
Level of education			5.30 (0.258)
No formal education	14 (23.7)	20 (26.3)	
Primary	6 (10.2)	10 (13.2)	
Middle/JHS	15 (25.4)	8 (10.5)	
SHS	15 (25.4)	24 (31.6)	
Tertiary and above	9 (15.3)	14 (18.4)	
Ethnicity			**(0.022) [F] ***
Kassem	43 (72.9)	69 (90.8)	
Nankam	8 (13.6)	4 (5.3)	
Other specify	8 (13.6)	3 (4.0)	
Marital status			(0.932) [F]
Single	13 (22.0)	17 (22.4)	
Co-habiting/Married	45 (76.3)	57 (75.0)	
Widowed	1 (1.7)	2 (2.6)	
Employment status			2.55 (0.279)
Unemployed	15 (25.4)	29 (38.2)	
Employed	10 (17.0)	12 (15.8)	
Self-employed	34 (57.6)	35 (46.1)	
Religion			(0.383) [F]
Traditional	1 (1.7)	4 (5.3)	
Christianity	37 (62.7)	51 (67.1)	
Islam	21 (35.6)	21 (27.6)	
Knowledge about COVID-19 PPs [1]			1.02 (0.312)
Inadequate	30 (50.9)	32 (42.1)	
Adequate	29 (49.2)	44 (57.9)	
Enforcement of COVID-19 PPs [1]			**14.47 (<0.0001) ***
Reminded	54 (91.5)	48 (63.2)	
Not reminded	5 (8.5)	28 (36.8)	

* Statistically significant at p<0.05; [F]: Fisher's exact test; **[1]:** Prevention protocols

5.4.2 Factors influencing low adherence to COVID-19 prevention protocols among non-healthcare workers in WMH

After adjusting for confounding variables (e.g mention variable) in a univariate logistic regression model, knowledge level about COVID-19 prevention protocols, and enforcement of COVID-19 prevention protocols were found as the factors that influence the low level of adherence to COVID-19 prevention protocols among non-healthcare workers in the KNM.

Respondents who had inadequate knowledge about COVID-19 prevention protocols had increased odds (AOR=2.30) not to adhere to COVID-19 prevention protocols compared to those who had adequate knowledge after adjusting for confounding variables (educational level, sex) (AOR=2.30; (95% CI=1.46 – 3.62); p<0.0001). Also, respondents who were not reminded to adhere (enforced) to the COVID-19 prevention protocols were 6 times more likely not to adhere to COVID-19 prevention protocols compared to those who were reminded after adjusting for confounding variables (Table 5.11).

Table 5. 11: Factors influencing low adherence to COVID-19 prevention protocols among non-healthcare workers in KNM

	Unadjusted Model			Adjusted model		
Factors	**OR**	**(95% CI)**	**p-value**	**AOR**	**(95% CI)**	**p-value**
Sex						
Male	1 (Ref.)					
Female	0.74	(0.50 – 1.11)	0.151			
Level of education						
No formal education	1 (Ref.)			1 (Ref.)		
Primary	0.75	(0.34 – 1.66)	0.477	0.72	(0.30 – 1.71)	0.451
Middle/JHS	0.77	(0.40 – 1.50)	0.443	0.68	(0.32 – 1.44)	0.316
SHS	1.34	(0.75 – 2.40)	0.323	0.93	(0.46 – 1.88)	0.846
Tertiary and above	1.87	(0.98 – 3.57)	0.056	1.13	(0.53 – 2.43)	0.750
Marital status						
Single	1 (Ref.)			1 (Ref.)		
Co-habiting/Married	0.58	(0.37 – 0.92)	**0.020***	0.64	(0.38 – 1.09)	0.099
Separated/divorced	1.28	(0.13 – 12.67)	0.835	0.69	(0.06 – 7.76)	0.762
Widowed	0.32	(0.10 – 0.98)	**0.047***	0.34	(0.09 – 1.29)	0.113
Knowledge level about COVID-19 PPs						
Adequate	1 (Ref.)			1 (Ref.)		
Inadequate	1.71	(1.13 – 2.57)	**0.011***	2.30	(1.46 – 3.62)	**<0.0001***
Enforcement of COVID-19 PPs						
Reminded	1 (Ref.)					
Not reminded	5.97	(3.58 – 9.96)	**<0.0001***	6.19	(3.62 – 10.59)	**<0.0001***

Statistically significant at p<0.05

5.4.3 Factors influencing low adherence to COVID-19 prevention protocols among non-healthcare workers in WMH

A multivariate logistic regression analysis revealed that respondents' knowledge level about COVID-19 prevention protocols and enforcement of COVID-19 prevention protocols were the factors influencing low adherence to COVID-19 prevention protocols among non-healthcare workers in the WMH.

Respondents who had inadequate knowledge about COVID-19 prevention protocols and respondents who were not reminded to adhere (enforced) to the COVID-19 prevention protocols were 3 and 5 times respectively, more likely not to adhere to COVID-19 prevention protocols after adjusting for confounding

variables (educational level, sex) (AOR=2.53; 95%CI: 1.37 – 4.66; p=0.003) and (AOR=5.42; 95%CI:2.89 – 10.18; p<0.0001) accordingly (Table 5.12).

Table 5. 12: Factors influencing low adherence to COVID-19 prevention protocols among non-healthcare workers in WMH

	Unadjusted Model			Adjusted model		
Factors	**OR**	**(95% CI)**	**p-value**	**AOR**	**(95% CI)**	**p-value**
Sex						
Male	1 (Ref.)			1 (Ref.)		
Female	0.57	(0.35 – 0.94)	**0.028***	0.59	(0.33 – 1.06)	0.079
Level of education						
No formal education	1 (Ref.)			1 (Ref.)		
Primary	0.55	(0.19 – 1.62)	0.281	0.37	(0.11 – 1.29)	0.119
Middle/JHS	1.12	(0.47 – 2.68)	0.799	1.01	(0.36 – 2.88)	0.982
SHS	1.49	(0.69 – 3.22)	0.308	0.91	(0.35 – 2.37)	0.842
Tertiary and above	2.36	(1.02 – 5.45)	**0.045 ***	1.02	(0.36 – 2.86)	0.968
Marital status						
Single	1 (Ref.)			1 (Ref.)		
Co-habiting/Married	0.49	(0.28 – 0.86)	**0.012 ***	0.54	(0.29 – 1.02)	0.056
Separated/divorced	1.03	(0.10 – 10.36)	0.981	0.67	(0.05 – 9.38)	0.763
Widowed	0.20	(0.05 – 0.73)	**0.015 ***	0.25	(0.05 – 1.33)	0.104
Knowledge level about COVID-19 PPs						
Adequate	1 (Ref.)			1 (Ref.)		
Inadequate	2.23	(1.28 – 3.86)	**0.004 ***	2.53	(1.37 – 4.66)	**0.003***
Enforcement of COVID-19 PPs						
Reminded	1 (Ref.)					
Not reminded	5.78	(3.19 – 10.48)	**<0.0001***	5.42	(2.89 – 10.18)	**<0.0001***

Statistically significant at p<0.05

5.4.4 Factors influencing low adherence to COVID-19 prevention protocols among non-healthcare workers in PDH

The multivariate logistic regression shows that enforcement of COVID-19 prevention protocols was found as the only factor that influences the low adherence to COVID-19 prevention protocols among non-healthcare workers in the PDH. Non-healthcare workers who were not reminded (not enforced) were 8 times more likely not to adhere to COVID-19 prevention protocols compared to those who were reminded,

and the difference was statistically significant (AOR= 7.69; (95% CI=2.54 – 23.30); p<0.0001) (Table 5.13).

Table 5. 13: Factors influencing low adherence to COVID-19 prevention protocols among non-healthcare workers in PDH

	Unadjusted Model			Adjusted model		
Factors	**OR**	**(95% CI)**	**p-value**	**AOR**	**(95% CI)**	**p-value**
Sex						
Male	1 (Ref.)					
Female	1.32	(0.65 – 2.66)	0.441			
Level of education						
No formal education	1 (Ref.)					
Primary	1.17	(0.34 – 3.96)	0.805			
Middle/JHS	0.37	(0.12 – 1.12)	0.078			
SHS	1.12	(0.44 – 2.87)	0.813			
Tertiary and above	1.09	(0.37 – 3.21)	0.877			
Ethnicity						
Kassem	4.28	(1.08 – 17.02)	**0.039***	4.75	(1.05 – 21.40)	**0.043***
Nankam	1.33	(0.22 – 7.98)	0.753	0.96	(0.13 – 6.94)	0.964
Others	1 (Ref.)		1 (Ref.)			
Marital status						
Single	1 (Ref.)					
Co-habiting/Married	0.97	(0.43 – 2.20)	0.939			
Widowed	1.53	(0.12 – 18.76)	0.740			
Knowledge level about COVID-19 PPs						
Adequate	1 (Ref.)					
Inadequate	1.42	(0.72 – 2.82)	0.313			
Enforcement of COVID-19 PPs						
Reminded	1 (Ref.)					
Not reminded	6.30	(2.25 – 17.61)	**<0.0001***	7.69	(2.54 – 23.30)	**<0.0001***

Statistically significant at p<0.05

5.5.0 Results from the qualitative arm of the study

The qualitative arm of the study was conducted to augment the data gleaned from the quantitative arm. The qualitative interviews were targeted at objectives three and four of the study. Participants (healthcare workers) were purposively selected because of their role or position in implementing COVID-19 prevention protocols at the facility. Participants ranged from unit heads, nursing officers, facility managers, and security guards. Eight individual in-depth interviews were conducted at the WMH while nine interviews were conducted at the PDH. The qualitative interviews were also conducted with heads of the units that were observed to ascertain the level of implementation and the challenges therein. A total of seventeen interviews made up the qualitative dataset for this study. Several themes that bothered the objectives of the study were discovered from the data and give a basis to better understand the responses from the non-healthcare workers who participated in the quantitative arm of the study.

5.5 Background information of qualitative study participants (Healthcare workers)

The mean age was 33 years, with a standard deviation of ±6.5. The majority of the respondents 12 (70.6%) were within the age range of 39-40 years. A greater proportion of 11 (64.7%) of the participants were males. A little above half 9 (52.9%) of the respondents were married. Most of the respondents 16 (94.1%) had a tertiary level of education. The dominant cadre of health workers 6 (35.3%) was Nursing Officers, and the majority 11 (64.7%) had practiced between 5-10 years. Also, more than three-fourths of the participants 13 (76.5%) confirmed they had received training on IPC (Table 5.14).

Table 5. 14: Background information of qualitative study participants

Characteristics	N (%)	War Memorial Hospital (n=8) n (%)	Paga District Hospital (n=9) n (%)
Age in years			
Mean (SD)	33.4±6.5	33.6±4.3	33.1±8.3
<20	-	-	-
20-29	3 (17.7)	1 (12.5)	2 (22.2)
30-39	12 (70.6)	6 (75.0)	6 (66.7)
40-49	1 (5.9)	1 (12.5)	-
40+	1 (5.9)	-	1 (11.1)
Sex			
Male	11 (64.7)	5 (62.5)	6 (66.7)
Female	6 (35.3)	3 (37.5)	3 (33.3)
Marital status			
Married	9 (52.9)	7 (87.5)	2 (22.2)
Single	8 (47.1)	1 (12.5)	7 (77.8)
Religion			
Traditionalist	1 (5.9)	1 (12.5)	-
Christian	13 (76.5)	5 (62.5)	8 (88.9)
Islam	3 (17.7)	2 (25.0)	1 (11.1)
Level of education			
Middle/JHS	1 (5.9)	1 (12.5)	-
SHS	-	-	-
Tertiary	16 (94.1)	7 (87.5)	9 (100.0)
Cadre of Health Worker			
Clinician	1 (5.9)	-	1 (11.1)
Enrolled Nurse	4 (23.5)	1 (12.5)	3 (33.3)
Nurse	3 (17.7)	-	3 (33.3)
Nursing Officer	6 (35.3)	6 (75.0)	-
MLS	1 (5.9)	-	1 (11.1)
Security	1 (5.9)	1 (12.5)	-
Snr Staff Nurse	1 (5.9)	-	1 (11.1)
Length of service			
Mean (SD)	6.2±3.9	8.6±2.3	4.1±3.9
<5	5 (29.4)	-	5 (55.6)
5-10	11 (64.7)	7 (87.5)	4 (44.4)
11-15	1 (5.9)	1 (12.5)	-
Training on IPC			
No	4 (23.5)	1 (12.5)	3 (33.3)
Yes	13 (76.5)	7 (87.5)	6 (66.7)

5.6 General implementation of COVID-19 prevention protocols at the facilities

Healthcare workers at the facilities were asked to rate the general implementation of the COVID-19 prevention protocols. The reason was to know where each of the facilities stood in terms of implementation of the protocols to understand the level of adherence on the part of non-healthcare workers. At the WMH, none of the respondents said the facility had fully implemented the protocols. Even though all eight respondents felt that the facility had done so much in terms of implementing the COVID-19 prevention protocols, they had the view that there was still a lot to be done. Some posited that the wearing of the nose mask was easy to implement but hand washing and social distancing were a major challenge and so could not give the facility any high ratings. Most respondents rated the implementation between 30% and 90%. Respondents at the WMH had this to say:

R: For that one, I will rate it 30% because it's a problem, especially the social distancing among patient and patient relatives, it's something we need to do something about. This place is an emergency ward so we can't always close our door and due to that people come in like that, the security men are also making things difficult for us. [IDI_WMH_EW_1]

R: No, not fully implemented, they have done a lot in that regard but still there's a lot to do. [IDI_WMH_MW_1].

R: Fully no, because the protocols there are a lot of them but if you look at ensuring of the wearing of the face mask, usage of sanitizer, we are doing very well, but when it comes to the distancing of our clients and washing of hands that one is still a challenge for us especially at the OPD here. [IDI_WMH_OPD_1].

The response at the PDH was not different. Even though all nine respondents had a lot of nice things to say about the facility's efforts in implementing the protocols, respondents felt there was still so much to be done in terms of implementation of the protocols. The respondents gave reasons for their high ratings of the facility to include the fact that the facility had strictly ensured nose mask-wearing at the wards and triaging at the main entrance within the hospital environment. They however could not give a full mark to the facility because social distancing was a major challenge and one could find some people in the hospital environment not adhering to the nose mask rule, and also because the facility had relaxed their efforts of implementation because cases were no longer being recorded. Respondents had this to share when they were asked to share their opinion on whether the facility had fully implemented the prevention protocols:

R: No, but we will get above 80% just because things are moving the way they are supposed to. [IDI_PDH_MS_1]

R: No, my brother. No in the sense that we don't have a lot of things. Some of the logistics are not available, we don't have them. I could say partially, yes, we have done our best. Per what we have, we work with them, but not all. [IDI_PDH_FW_1].

R: Not fully. I think how people enter the hospital because they don't have security that will restrict people who are not wearing masks from entering into the facility. I think with most of the wards, we can restrict people from entering into the ward but for the hospital environment, because we don't have only one gate, people enter from different sides. [IDI_PDH_KW_1].

R: I wouldn't say so especially these days because we've not been hearing an increased report on the number of cases. It is obvious people have gone to sleep and those protocols are not as effective as they used to be when the COVID started. [IDI_PDH_LAB_1].

5.7 Implementation processes/strategies by facilities

The preventive regulations from the WHO and the guidelines for primary healthcare facilities from the CDC to limit transmission of the coronavirus are usually adapted and localized via strategies and processes that the locals can easily identify with. The protocols are usually advised to be implemented within already existing structures and systems to make the change easier for the population. In this regard, the facilities used various strategies to implement the protocols. At the WMH, a triaging unit/table was placed around the records department in the hospital environment to ensure that everyone who comes to the department wore a mask, sanitized their hands, and had a temperature less than 40" C. This strategy was to identify suspected cases even before they get into the facility. Apart from the triaging unit/table, a special unit or ward was established to hold and hospitalize confirmed cases. Veronica buckets were also provided to each unit to ensure handwashing while education and strict enforcement of the no nose mask no entry rule was ensured. The facility also provided logistics such as soap and sanitizers and other PPEs to both healthcare workers and non-healthcare workers. These strategies however had their challenges. The fact that there were no demarcations or directions of the 1meter apart rule made social distancing very difficult in the facility. The provision of logistics was also inconsistent and healthcare workers complained about the fact that they had to purchase nose masks themselves. The security was also inadequate to enforce the no-mask no-entry rule.

R: Yes and No, yes because we have instituted some changes in the hospital to ensure that people adhere to the measures that are implemented to help fight COVID-19 and no because there are staff and patients who appear in the hospital setting without fully adhering to the protocols, so that is why am saying yes and no. [IDI_WMH_CU_1].

R: At the beginning, people donated veronica buckets so they said every ward should have one in front of the ward for hand washing. Then, to ensure anyone going in and out should wear a mask, especially the health workers, not just in the hospital but outside. Patents' relatives and the patients themselves should also wear nose masks so there are people at the gate, the security so when you enter and you are not in the mask, you are not allowed to go in. [IDI_WMH_FW_1].

R: They ensure there's water and soap for us to wash our hands, the only problem is the mask they don't provide us with the mask we have to get our masks for our use. The visiting hours are not fully enforced, it is difficult for nurses to be doing their work whiles enforcing the protocols, sometimes you just see people walking in without masks but because you are busy doing something else you can't tell them to put them on and there is no security man at the gate to prevent people from entering without masks. [IDI_WMH_MW_1].

The implementation process/strategies at the PDH were not any different from the WMH. The PDH however organized several infection prevention control (IPC) training activities for all staff at the facility to get them prepared for the task of ensuring and empowering other facility users to limit the spread of the coronavirus. Similar to the challenges that characterized the WMH strategies, the PDH strategies experienced several challenges especially because the facility does not have a single gate that makes it easy for the triaging process. Facility users enter the hospital environment through various unauthorized entrances and because the facility has limited security persons, nothing could be done to stop this except for education and gentle appeals. The facility is also relatively small and does not have the needed space at the various units to sup\port social distancing.

R: We did the training for infection prevention alright. All our nurses and staff are trained except those who are new. And those who are new and have not been trained are part of the reason I said at least 90%. Then we also talk of the handwashing items which we have put at vantage points. We also try to enforce the wearing of nose masks. Even our clients who are within the premises are supposed to wear it and we ensure that if they don't wear it, we don't entertain them. But as I said, we haven't achieved 100%, at times, people sneak in and before you realize it, they are inside the ward. We also try as much as possible to prevent visitors from coming but it's still very difficult because we don't have security to stop them. [IDI_PDH_MS_1].

R: Firstly, we start from our triaging under the tree so, we triage the patients. Especially for those who have difficulty in breathing, we just separate you right from there to the isolation center. You don't come to mingle with the rest of the patients because we don't know what is causing that so we take you there. And you make sure they either wash their hands or sanitize their hands before they get here. We give them education on COVID-19 every morning and we encourage them to wear masks and those who don't have masks, if we have some, we give them but if we don't have, we direct them to the drug store across the road to buy some. [IDI_PDH_OPD_1].

5.8 Successes with implementation at the facilities

The discussions with the healthcare workers at the facilities discovered some successes with the implementation of the prevention protocols. The WMH reported that already existing structures and systems helped them to implement the protocols with much ease. They also reported that the educational activities of both the facility, the Navrongo Health Research Centre, and the District Health Management Team, on COVID-19, improved the knowledge of the people on the prevention protocols and caused the implementation of the protocols to be successful. The facility also reported strict enforcement of the protocols with threats to deny services to defaulters as

another measure that caused success with the implementation. Healthcare workers already knew what was expected of them and were self-motivated to comply with the prevention protocols causing some success with the implementation. These successes however had their challenges. When asked to share their views on what made implementation successful, respondents had this to say:

R: Here handwashing and hand hygiene, in general, is already part of our protocols so mostly we try our best to enforce those. Initially when the COVID'19 started everyone was trying their best to obey but for now, they don't obey the protocols. In our wards, for instance, our beds were already spaced before COVID'19 came. [IDI_WMH_EW_1]

R: Okay, we run a shift because of the shortage of staff and also because at the peak time when people come to the hospital it was mostly in the morning, so it was always within the morning that we had crowds there, so the nurses stay there between 8 am up to 2 pm before they close. So, after 2 pm the general triage is expected to be done at the OPD and also the prescribers are encouraged to look out for cases during that time. [IDI_WMH_CU_1].

R: I think it's the awareness, people are aware of it but with that, it's not even easy especially wearing the mask. But because of the no-nose mask-no-entry rule, relatives adhere just to be able to see their relatives. If you are entering and I say don't come in unless you wear a mask, that's the only thing that makes it easy. As for handwashing, it's our thing, we the nurses do it often. After every procedure, after attending to your patient, you wash your hands but with one thing will be the soap. Sometimes we don't get soap. [IDI_WMH_FW_1].

R: I think the everyday education and the exemplary lifestyle of healthcare workers let people know that this is what they are supposed to be doing. [IDI_WMH_TT_1].

R: Yes, I have realized that those people who don't want to wear the nose mask don't know what they are doing, so even if they insult or slap me, I will forgive them and continue with my work and when you meet such a person you still educate him/her to know the reason why you did not get angry with him/her because you are concern about their health. [IDI_WMH_SO_1].

At the PDH, some successes with the implementation were also reported. Most respondents reported similar successes with implementation as the WMH. Respondents mentioned continuous education, strict enforcement of protocols, and self-motivation as some of the strengths of their implementation strategies. Peculiar to the PDH was the fact that a majority of the respondents reported that they allowed improvision a lot of the time to help people comply with the prevention protocols. It was interesting that healthcare workers counted this as a success with the implementation.

R: Some use their veils, so if they don't have masks, they will tell me and I will say okay, use your veil or handkerchief, at least, it's better than nothing. [IDI_PDH_OPD_1]

The majority of the respondents also reported that due to the donations from the regional health directorate, the NHRC, and other benevolent agencies, the facility had a lot of logistics available for their use which caused the successful implementation of the protocols, especially during the peak of the second wave of infections. Respondents feel it is imperative on the facility to, first of all, make logistics available before they request adherence from facility users.

R: Then when it comes to the logistics, for hand washing, water is not a problem, soap is not also a problem and lots of other things. [IDI_PDH_MS_1]

R: I think the facility and its partners are doing their best by providing sanitizers and other things. Soap, water, and tissues are always available so, they are doing their best for us. When they are

not doing it, I will still say it because I don't fear but that's the reality now. You can see everything is available. You can see gallons of water, sanitizers, spirit so, why will I lie. [IDI_PDH_MW_1]

The respondents at the PDH however noted that implementation was particularly not easy. All nine respondents at a point or another during the discussion used the phrase "it is not easy", especially when asked how easy implementing the protocols has been. To most respondents, the protocols are being implemented with human beings, and that for them is the major cause of any low level of implementation that the facility may experience because human beings are not easy to control.

R: It's not easy, I've not seen it to be easy because I'm dealing with people and you know they have a different kind of mindset and all that. Someone will tell you that anytime he or she puts on the nose mask, the fellow cannot breathe. It's not easy, there's nothing easy around here, we fight every day. Someone will just come and be walking away, you call the fellow and he will not mind you. We have some people that will come, they are already in their nose masks, you see them with sanitizer and all that. I don't know whether that's why you say it's easy, but that might be one person passing. So, it is not easy. [IDI_PDH_TT_01]

R: Is not easy to get the people to obey the protocols, it hasn't been easy because you educate someone today, tomorrow he/she repeats the same thing. Even though we are trying our best but it hasn't been easy. Some people when you try educating them, won't mind you, they will just walk away, some think that because their relative is sick you don't need to be asking them to wear a facemask. [IDI_PDH_TT_02]

R: It's not easy because some don't even comply at all. You see the man who was coming and we asked him to wear a mask, he complied and wore it but some will not even mind you. They just enter without even paying attention to what you are saying. [IDI_PDH_FW_1]

5.9 Challenges with the implementation of the prevention protocols in facilities

Despite the numerous successes with implementation reported by respondents, there are some challenges with the implementation of the protocols. The fact that respondents kept emphasizing that implementation of the protocols is not easy gave some validity to the fourth objective of this study. During the discussions with healthcare workers at the WMH, the majority of the respondents identified the challenges of the implementation to include; burden of work especially in the ward, financial challenges, lack or inadequate logistics, non-cooperativeness of patients and their relatives, lack of motivation for healthcare workers, and challenges with security.

Some of the respondents expressed how difficult it is for them to work and enforce protocols alongside. They expressed that some patients and their relatives take advantage of the fact that they are busy with other duties to flout the protocols.

R: ……the visiting hours are not fully enforced, it's difficult for nurses to be doing their work whiles enforcing the protocols, sometimes you just see people walking in without mask but because you are busy doing something else you can't tell them to put on and there is no security man at the gate to prevent people from entering without masks. [IDI_WMH_MW_1]

The majority of respondents also expressed financial challenges as a major challenge with the implementation of the protocols. They are of the view that all the challenges with the implementation are a result of the facility's financial inadequacy. They posit the facility would be in a better position to fully implement the protocols barring inadequate finances.

R: The challenges all deal with finances, if the hospital has enough money to provide the things, we will go by them and make sure the patients and their relatives do the same. [IDI_WMH_FW_1]

Respondents also expressed a serious lack of logistics as a challenge to the implementation of the prevention protocols. The logistics situation at the facility makes it difficult for implementers to insist or be consistent with defaulters of the protocols. They gave examples of situations where facility users wanted to wash their hands but had no access to soap or had no access to nose masks to cover their nose and mouth.

R: The biggest challenge we have is the logistics, sometimes someone will come and ask you for nose masks and you cannot also say no because that person may be coughing seriously, so you will have to do your best to help that person and the people around that individual. [IDI_WMH_TT_1]

R: ... we are still battling logistics issues and logistics is one of the important things if you want to fight COVID'19, then security-wise the issues are still the same way, we are just coming from Monday meeting and every day we keep talking about the same things. Mostly what they will say is that it all boils down to money because we used to buy a box of gloves at 25gh and now due to COVID a box of gloves is 75gh, Facemasks was also cheap but after COVID came it has become expensive and the facility says NHIS has not increased their tariffs so our expenditure is now exceeding our generation because of that sometimes some of the things they cannot do especially with the logistics they cannot, so it's been hard. [IDI_WMH_EW_1]

R: Logistics, I am talking about the basic supplies of gloves and other things. And if you work in an ideal COVID-19 situation where you see a serious COVID-19 case, in some instances you need to double the gloves to use and now you don't have enough how do you double. So, I think personnel, logistics, staff indifference, reckless behavior, and motivation are the challenges we have. [IDI_WMH_CU_1].

Patients and their relatives are a different category of facility users. They are the non-healthcare workers in the facilities and those from whom compliance is expected. The implementers however reported in the discussions that patients and their relative's rebel and default even with very basic protocols of nose mask use. Lack of cooperation from patients, their relatives, and some healthcare workers makes the implementation of the protocols more difficult than it should be.

R: When I say he/she should wear a nose mask, they ask me whether it is by force for him/her to wear after all he/she is not wearing it for me; that is what they tell me. For the nose mask, you are supposed to wear when coming into the hospital but I cannot force you to wear it when you are outside the hospital, but since this is a hospital, I'm not saying I am going to infect you with a disease but I want you to protect yourself and those there to will be protected as well. For others, the moment you tell them to wear a mask he/they will just tell you that he/they cannot breathe well. So that's the problem, they do not cooperate and we won't allow you to enter [IDI_WMH_SO_1]

R: That's even another problem, cooperation is very poor, sometimes you will even see a patient relative entering without a mask and you will be talking and the person won't mind you as if you are not even a human being [IDI_WMH_MW_1]

Another challenge shared by healthcare workers at the WMH is the lack of motivation for staff. They revealed that the government made a lot of promises to health personnel who risk their lives to work at the COVID units but none of these promises are being fulfilled. This they say makes them feel reluctant and reduces their interest in COVID-related issues. The effects of the low interest of implementers on the implementation outcome cannot be overstated.

R: I think the motivation of staff, especially those at the units. If you recall the outbreak of the COVID-19 a lot of promises were made by the government to help care for staff. I was not even

doing this work, the hospital struggles to get people to work in the unit. We had an instant where we lost staff to COVID-19 and the day we had to move him around if you were here to see the struggle, we had to go through getting staff to go to his house and pick him up to Bolgatanga the treatment center, it was not easy. So, motivation [IDI_WMH_CU_1].

The last challenge of implementation as expressed by most respondents at the WMH is the security situation at the facility. Respondents noted that the facility does not have an adequate number of security personnel to enforce the protocols at all points and units of the facility. Respondents shared that most of the security personnel are casual workers and due to the financial constraints of the facility, they are not being paid and so a lot of them have stopped coming to work. Some respondents also identified that the few securities that is there are not empowered enough to strictly enforce the protocols. This they explained is the result of the way some other cadres of healthcare workers treat the security guards. The following opinions were shared on the security situation;

R: Is all about money matters my brother, the security has not been empowered enough, I think the way things are going on, especially the guy who attacked the security should have been picked up at the police station because you cannot come to the hospital and do what you want, things like that keep happening so I think we should pick up two or three people just to scare people. Bolgatanga hospital is not even like ours, ours is even enclosed as compared to theirs so at least things should have been better here, and here is the case if you are trying to stop someone, you will end up quarreling with the person and the person will tell you we will meet in town, with this you will be scared especially that most of the security workers are casual workers, they are not being paid regularly sometimes it takes like three months or four months before they pay them because of that they do relax with the implementation [IDI_WMH_EW_1]

R: As for that one, what we were initially doing is that we move with a team from the unit and the security people to the entrance of the hospital irrespective of who you are if you are coming in you have to wear a mask before you enter. The truth is that most staff don't respect the security and even that aside some of us who have worked here for so long knows almost everybody, sometimes you have to exchange words with people before they wear the mask, so our greatest challenge is empowering the security to ensure that everybody entering wears a mask, [IDI_WMH_CU_1]

The discussions at the PDH revealed very similar challenges with the implementation of the COVID-19 prevention protocols. All nine respondents mentioned that the implementation of the protocols was challenged by financial constraints on the part of management and facility users, lack of logistics, implementation inconsistencies, lack of cooperation from patients and their relatives, language barrier and human relations, security, space, fence, and lack of attention to education. The majority of the respondents felt that the facility has done and continues to do its best possible, but the challenges nullify the positive outcomes of the implementation.

Financial constraints on the facility make it impossible to focus resources on purchasing prevention protocol materials. Respondents reported that the facility has several competing and equally important needs that must be satisfied. This makes it impossible for the facility to provide logistics and other materials that may run out. Some patients and their relatives who genuinely can't afford basic preventive materials such as a nose mask do not get help at all times because of these financial constraints. Some respondents had this to share;

R: Even our environment alone is not very encouraging, it is not very good. With that, someone may think we are supposed to do it but it has gone beyond our capability. Look at the fencing issue, there is no government fund support. They said we should use our internally generated income which is the insurance. The reimbursement is very poor. Then, when you consider the pressure on

it, we are buying all our logistics from it, we are paying for medications from it. The same money we use to run everything. Now they are saying we should buy a vehicle so that's the same money. I don't know but when you calculate and make a serious analysis of what is paid per service, you would see that the margin of the profit on it is very small compared to the responsibilities which we are supposed to use it for. [IDI_PDH_MS_1]

R: But you will see that some genuinely want to get the mask but they don't have so, with that, if I have some, I give them. [IDI_PDH_OPD_1]

A lack of logistics is directly linked with financial constraints. Most respondents reported that it was difficult to get logistics at all times for staff and patients to use. This they reported makes some of them (staff and patients) make excuses to be careless with the prevention protocols thereby affecting the facility's efforts to fully implement the prevention protocols. Respondents had this to say about the logistics situation of the PDH;

R: No, my brother. No in the sense that we don't have a lot of things. Some of the logistics are not available, we don't have them. [IDI_PDH_FW_1]

R: Sometimes some of the logistics like the gloves, tissue, soap and with water, we always have water running so that is not a problem. But it comes to a time, even to attend to a patient, there are no gloves so you have to write for the patient relative to go and buy the gloves and come. And with the mask, some staff will come and tell you they don't have masks and you go to stores which is the only place you can go to get it and give the staff and some of the clients, and there's none. With that, you don't know what to do, you just have to tell them to go and buy because most of the nose masks we are using, we all bought them. So sometimes affordability, the facility is not able to provide. [IDI_PDH_OPD_1]

Another interesting theme discovered from the discussions as a challenge to the implementation of prevention protocols at the PDH is the inconsistency on the part of implementers in the sense that the implementation is left in the hands of very few healthcare workers. Once the implementers are not saying or taking similar actions within the facility, it makes those who try to strictly implement the protocols appear less humane. Most patients, relatives, and other staff do not appreciate it when they can go to certain units in the facility without being disturbed about COVID-19 protocols, yet can't access other units because they are not adhering to one protocol or the other. Closely linked to this is the fact that some patients and relatives appeal to the human side of implementers, causing them to look the other way and allowing them access to places they should not have thereby endangering their lives and the larger population to an extent. Respondents had this to share;

R: The difficult aspect that I think I chipped in was when you are kind of facing the wrath of the people. People become offended by you insisting that they should do the right thing. I quite remember a lady who was admitted to the ward who came for me to take her sample and work on it. She wasn't in a mask and when I asked her to go and wear a mask before, she was saying she's suffering and she suffered to come here so do I want her to go back to the ward or wherever before? If only I could just take the sample so that she will go back and put on a mask. So, you see… She passed from the ward that she was without wearing and came here and you are now telling her to wear it. It makes it difficult if we are not all trying to ensure that the protocols are adhered to. If the work is left to a few people, it makes it difficult. [IDI_PDH_LAB_1]

R: I feel bad because it's like the person is here for his health but has to leave because of something else but in all, we look on the brighter side, it's all for the person's benefit. So, some get up and

leave but I say ok if you think you can go to a different hospital and they will attend to you without a mask, then that is your problem. [IDI_PDH_OPD_1].

Away from logistics and finances, some participants of the discussions think that the implementation challenges exist because the facility is understaffed. They posit that the inadequacy of healthcare workers makes it difficult to enforce all the prevention protocols and strategies at all times.

R: …. Sometimes too, our number because they moved someone from OPD to sit at the triaging table making it difficult sometimes. Sometimes when the OPD is choked, no one is always there. I think that's the main reason, our number is a problem. [IDI_PDH_KW_1]

Healthcare workers also expressed that education was a big challenge to the implementation efforts of the facility. They explained that there were several educational activities by the facility and its partners. They also acknowledged the efforts of the community and expressed their opinion on the fact that they could have done more in terms of educating the people. Most respondents felt that the attitude of patients and their relatives to the COVID-19 protocols was a result of inadequate information at their disposal. Others also felt that even people who have the information are just not paying attention to it and so flout the protocols at will. They had this to share;

R: Some of them don't know the condition. They don't understand what is going on. I don't know whether it's a lack of information or something. The community should have done more. You know we have this COVID-19 van … but they are not educating the people. Because, if there's much education in town when they get here, we would not have to talk much. Even at the entrance, you have to talk plenty, some of them will not come in masks, and when you say they get offended. [IDI_PDH_FW_1]

On challenges with implementation, the PDH health workers also reported a lack of cooperation from patients and their relatives. They described the lack of cooperation as disrespect to the health workers probably because they do not understand what is at stake, or because they feel the healthcare workers do not communicate to them in a language they understand. The majority of respondents mentioned the language barrier as a challenge to the implementation of the protocols and as one of the reasons for the lack of cooperation from patients and their relatives. They had this to share;

R: You know dealing with human beings, in general, is very difficult, that's the problem. Some of them intentionally come without masks and when you ask them to wear one, especially the patients' relatives, they pretend they haven't heard you. Others will also turn it into violence and let you know that "all die be die". They will even ask me if it's COVID-19 that's keeping my patients here. Then I will tell them it's not COVID-19 but COVID-19 will even be more than what they are going through. [IDI_PDH_MW_1]

R: Yes. Because of the no-mask no-entry, only I and another lady speak the local language, the others don't. So, when they come and you ask them not to enter without masks, they tell us that we are their sisters yet anytime they come and the others ask them not to enter, we just sit without doing anything. Then I always tell them that they didn't ask them not to enter, they said they should do something before they are allowed to enter. We have been having challenges here. [IDI_PDH_KW_1]

R: Sometimes some people don't like to be told what to do so, you will tell the person to sit here but the person thinks where he or she s sitting is the best so, it becomes difficult. And language barrier, most of them don't speak Kassem so how to communicate with them is difficult but we try

a little for them to be able to understand us and we make those who understand the language translate to them. [IDI_PDH_OPD_1]

R: We are also having a challenge which is the language barrier some people come here they don't speak English and some of us here don't understand the local language, how do you interact with that person and how do you tell such a person to wear or wash their hands, it becomes very difficult. [IDI_PDH_TT_02]

R: Sometimes, it's the language barrier. When you are trying to explain yourself to them, they feel you are too strict or you are disturbing them. Because they don't understand the language, I don't know how to explain myself to them for them to understand that it's not like I am being strict but I'm protecting you, myself, and the patient you are coming to see. You can't just come and visit someone and go home with a different thing. So the challenges, the language barrier is number 1. Number 2, they see some of us as southerners, so we have come to accept it. [IDI_PDH_FW_1]

The last challenge as expressed by respondents at the PDH is the nature of the hospital environment. The majority of the participants reported that the facility is not fenced and that makes it very difficult to enforce the protocols and other strategies of infection prevention at all times. Despite the numerous routes through which people can access the units of the facility including the wards, the situation would have been different if there were security men at the facility. Respondents reported that the facility had no security guards to help control defaulters and restrict people from accessing the units through other routes. The space within the facility is also another challenge. As a district hospital, there are days and periods of the day where there are so many people seeking healthcare, and that becomes difficult to practice social distancing. Once the healthcare workers are overwhelmed by the numbers, attention is taken from the prevention protocols to focus on caring for them to leave so that the environment can have space for those

still coming. On the security, fence, and space situation of the facility, respondents had this to share;

R: .... People sneak in and before you realize it, they are inside the ward. We also try as much as possible to prevent visitors from coming but it's still very difficult because we don't have security to stop them. So, before you know, there are visitors in the ward which we don't want them in except those who are taking care of our clients. As I already said, we don't have security which we will make sure that people don't enter the facility just like that. Then also, when you look at the facility, we don't have a fence and there are so many entrances so people enter just like that. So, it is very difficult to control the people who come in. [IDI_PDH_MS_1]

R: As you can see the hospital is not fenced and there are so many routes you can pass to enter here, so at times it's not everyone you can get to pass through this process. [IDI_PDH_TT_02]

R: The main challenge is just the spacing issue. With that one, guess it's up to management to deal with it. Not with COVID as such but with the lab, we've been having challenges when it comes to spacing. Even with our main working area, the space is not there not to talk of the waiting area, it's just one bench so imagine they are up to 10 people, where will they sit. That's our main challenge. [IDI_PDH_LAB_1]

R: The challenge I can put here is just maybe the social distancing. As I said and as you can see for yourself, it's a hospital and the space is not that much. So as much as we try to do that, sometimes we get the crowd and it gets out of hand. But we still put in the nose mask, sanitizer, I think that will reduce it a bit. But the only challenge here is the space and crowd, we can't observe social distancing sometimes. That's the only challenge that we face here. [IDI_PDH_TT_01].

5.10 Recommendations to improve implementation of prevention protocols at facilities

All seventeen participants of the individual in-depth interviews were asked to share their opinions on what can be done to improve the implementation of the protocols in the facilities. The majority of the participants held the view that stakeholder engagement was the most important thing to do if the facilities would be able to fully implement the safety protocols. In their view, bringing the local government, the health agencies, and the educational institutions together would improve the validity and information sharing circle to ensure that all people have adequate knowledge of the prevention protocols.

Others posited that continuous education even at periods where the virus is mild would go a long way to refreshen the minds of the population. They reported that once nothing is being said about the virus, people tend to relax and that could be the reason why some do not believe it is real and so refuse to cooperate with implementers. Effective education will lead to a change in attitude towards the prevention protocols.

Away from stakeholder engagement, education, and change in attitude, participants believe that facilities have to be stocked with logistics to make them available to people to use. They posit that if facilities do not have logistics, the rest of the efforts to improve implementation would be nullified. There is no implementation without logistics. With the advent of vaccines, some participants believe that facilities should be stocked with vaccines to also help contain the spread and morbidity from the virus.

One important opinion shared by most participants was the expectation of implementers to lead by example. They reported that implementers had a greater chance of being successful with implementation when they live what they preach even beyond the borders of the facility. Healthcare workers however encouraged that the implementation of the protocols should not be left only in

their hands but everyone should come on board with the community spirit to ensure that the good news gets to everyone. They think much more success could be achieved with the implementation if everyone becomes an ambassador of the protocols and encourages others to obey them.

While calling on the community to come on board, healthcare workers acknowledge that supportive supervision could also keep them on their toes in terms of strict enforcement of the protocols. They posit that regular visits from higher authorities would remind them of what is at stake and what they need to be doing.

They end their recommendations with the view that security where available has to be empowered to strictly enforce the protocols without fear or favor.

5.11 Other interesting themes from the discussions

Implementers of the COVID-19 prevention protocols at the facilities come in contact with different facility users at various periods. The interesting things they hear and experience from people especially from those who do not want to cooperate or obey the protocols can only be imagined. A few of these themes were shared during the discussions with the healthcare workers. While the interviews from the two facilities had varying interesting themes, one that was common between the two facilities and on the lips of almost all the seventeen respondents is the belief among the people (patients and relatives), and surprisingly some other healthcare workers, that COVID-19 is not real. The respondents shared that a lot of the people they encounter do not believe there is a real disease that affects people. While others feel it is a political hoax, others posit that it is a disease for a particular class or certain people and so does not affect everyone especially people in rural settings like Paga and Navrongo. Below are a few quotes from the discussions;

R: I think people still don't even believe it's there, they think it's about politics, maybe people want money from donations that's why they are just doing that. [IDI_WMH_FW_1]

R: To be frank, some do and others don't do, even the health workers some of us don't believe. [IDI_WMH_MW_1]

R: I don't know whether the education is not enough or others also believe that the disease doesn't even exist. Someone will come and you will tell them to do this but they will say the disease is not even there because they've never seen someone with it. [IDI_PDH_KW_1]

R: I think it will be very good if more public education can take place because some of the patients, even up until now, you will talk to them and give them the chance to ask questions and they will tell you that they don't believe there's COVID and that it's just a political trick that the politicians are using on us. Because they have never seen anyone with COVID, they believe there is no COVID. [IDI_PDH_OPD_1]

5.12 Summary of results

Adherence was poor among NHCW in WMH (63.41%) as compared to 56.30% in WMH. The overall level of adherence in the district was however low as (61.14%) of the NHCW in the district did not adhere or comply with the prevention protocols. The factors that influence adherence are knowledge of COVID-19 prevention protocols and enforcement. The challenges with implementation as expanded in the qualitative interviews include burden of work especially in the ward, financial challenges, lack or inadequate logistics, non-cooperativeness of patients and their relatives, lack of motivation for healthcare workers, and challenges with security.

CHAPTER SIX: DISCUSSION

6.0. Introduction

The implementation of COVID-19 prevention protocols in selected health facilities in the Kassena-Nankana district of the Upper East region was investigated in this study. Key findings from the study include the overall level of Adherence to COVID-19 prevention protocols in the KND, the factors that influence low adherence, and the challenges of implementing the prevention protocols. This chapter discusses the implications of these findings and their relationship with existing literature.

6.1 Adherence to COVID-19 prevention protocols among healthcare workers and non-healthcare workers

Findings from this study show poor adherence to COVID-19 prevention protocols during healthcare and non-healthcare workers' interactions. This is consistent with a similar study in Tanzanian outpatient facilities which reported a high rate of poor adherence to COVID-19 prevention protocols among healthcare workers (Powell-Jackson et al., 2020). However, a study among healthcare workers in the northeastern United States concluded that poor adherence to COVID-19 prevention protocols were low (Russell et al, 2018). The vast differences in adherence to COVID-19 prevention protocols may be due to the time the studies were conducted and whether compliance was observed or reported. The study in the northeastern United States (Russell et al, 2018) measured compliance by only self-reporting, while the present study measured compliance by self-reporting and observation. This may be a possible explanation for the poor adherence to COVID-19 prevention protocols in this study. Adherence to COVID-19 prevention protocols play a critical role in reducing both healthcare and non-healthcare workers' exposure to the COVID-19 virus. In contrast, non-

Adherence to COVID-19 prevention protocols are important factors for COVID-19 infection among healthcare workers (Xiong et al., 2020). WHO in their interim guidance on Infection Prevention Control (IPC) recommends strict adherence to IPC protocols in managing COVID-19 patients (WHO, 2022).

This current study also suggests a low rate of Adherence to hand hygiene protocols among non-healthcare workers. This finding supports reports from an observational study in Turkey before the COVID-19 pandemic which revealed low compliance with hand hygiene during healthcare interactions with patients (Karaaslan et al., 2014). Improving sustained hand hygiene compliance in healthcare settings will require continuous training of healthcare workers on IPC (Chavali, S., Menon, V., & Shukla, 2014). Even though evidence from this current study show that about three-fourths of the healthcare workers who participated in the qualitative study (76.47%) confirmed they had received training on IPC, emphasis should be placed on continuous IPC training to improve healthcare worker compliance as suggested by Chavali et al (Chavali, S., Menon, V., & Shukla, 2014).

6.2 Availability of COVID-19 prevention protocols materials at vantage points in health facilities

A network of factors comes to play in facilitating healthcare and non-healthcare workers' adherence to COVID-19 prevention protocols. Clear IPC guidelines, effective communication, support from managers, training, access, and trust in PPEs are critical in promoting compliance with IPC protocols (Houghton et al., 2020).

In contrast with studies elsewhere (Powell-Jackson et al., 2020; Sarfraz et al., 2020), there were no available disposable towels and tissues including loud reminders to practice hand hygiene at

vantage points in the selected health facilities during the observation. Soap or soap solution, dust bins, and hand sanitizers at vantage points were rarely seen during the period of observation in the health facilities. Appropriately the availability of COVID-19 prevention protocols materials encourages adherence to PPE use and is effective in reducing the risk of infection in health facilities (Verbeek et al., 2021). Indeed, personal protective equipment use is efficacious in preventing nosocomial transmission of SARS-CoV-2 (Zhao et al., 2020). Not providing these protocols and other cues to action within the facility may breed some level of resistance to comply with safety measures by facility users. The implementers in the facilities agreed in their discussion that even some healthcare workers who they expect to know better sometimes refuse to comply with the prevention protocols just because the facility fails at one point or another to provide these materials that they need to be compliant with.

Compliance with hand hygiene and nose mask usage was proportionally lower among non-healthcare workers than among healthcare workers. This is in line with a previous study, where they found low compliance with PPEs usage among non-healthcare workers (Wee et al., 2020b). The risk of COVID-19 infection is not limited to only frontline healthcare workers, but other non-healthcare workers, also face a substantial risk of being infected with SARS-CoV-2 (Wee et al., 2020a). Infection prevention and control efforts to combat the spread of COVID-19 in hospitals should include non-healthcare workers (Wee et al., 2020a). This is crucial in achieving zero healthcare-associated transmission of COVID-19 in healthcare settings (Wee et al., 2020b). Hence, implementers of these prevention protocols may need strict enforcement of the prevention protocols to ensure the hospital setting is safe for all users.

6.3 Factors influencing the adherence to COVID-19 prevention protocols among healthcare workers and non-healthcare workers

This study discovered a significant association between knowledge and enforcement and a low level of adherence to COVID-19 prevention protocols among non-healthcare workers. Apart from healthcare workers' socio-demographics, they reported that their Adherence was influenced by workload, their perceptions and experiences with the virus, and the facilities' inability to provide certain logistics for their use. This was also found in several studies in Ghana and elsewhere that knowledge, socio-demographics of healthcare and non- healthcare workers influence their attitude to personal protective equipment and their general compliance with preventive protocols (Apanga & Kumbeni, n.d.; Ashinyo et al., 2021; Piché- Renaud et al., 2021).

Although the socio-demographic characteristics of people including healthcare workers and non-healthcare workers play a very big role in how they perceive and relate to issues, the current study found no statistically significant association between participants' gender, age, and educational level, and adherence to COVID-19 prevention protocols. This is in contrast with a study in Ethiopia that revealed that participants' age and educational level presents a high likelihood for adherence to safety protocols (Azene et al., 2020).

6.4 Challenges of implementation of COVID-19 prevention protocols in health facilities

This study held discussions with the implementers of the COVID-19 prevention protocols at the facilities to understand what challenges they face while implementing the protocols, their successes with implementation, and recommendations by implementers to improve adherence. The study found implementers to include unit heads, facility managers, nursing officers, and security guards. These cadres of health workers are at the helm of implementation

efforts in the facilities and face most of the challenges with healthcare and non-healthcare workers while implementing the prevention protocols.

Implementers reported that their workload within the facility is a major challenge that affected their ability to strictly enforce the protocols. Several examples of implementers especially nurses in the ward were given of they while busy with other important work in the ward, patients and their relatives walk in without any regard for the prevention protocols. The pandemic has particularly increased the amount of work in health facilities as some facility managers explained that some staff who took ill had to stay home leaving a handful to handle the work. This finding is in concordance with a similar study in Italy that assessed the impact of the pandemic on HCWs (Felice et al., 2020).

Lack of logistics was also a major challenge to the implementation of prevention protocols. Implementers at the facilities reported that logistics had become very expensive due to the pandemic. The inability of the facilities to make available logistics at every point in time gave rise and increased the impact of other challenges such as lack of cooperation with implementers. A study of other public settings in Ghana revealed similar findings that lack of logistics and inconsistency in providing logistics will cause a lack of cooperation that will adversely affect implementation processes (Bonful et al., 2020).

A peculiar challenge especially to the Paga District Hospital was the facility environment itself posing a challenge to the implementation of COVID-19 prevention protocols. The facility had no space for adequate spacing in the wards and had no fence to ensure everyone coming into the facility was triaged. The managers at the facility shared that this particular challenge was greatly linked to the financial and resource challenges already shared. They explained that it was difficult to get the facility fenced because of other important needs competing for the same limited

resources. The facility environment, therefore, had to be left as it is, and implementers focused on just those they could reach because the facility (PDH) like every other facility in the district did not have adequate security to fully and consistently implement the COVID-19 prevention protocols. These findings were in concordance with a study in England that assessed the implementation of COVID-19 prevention measures in schools that also found that resources, environment, and implementer's workload were factors that challenged implementation (Sundaram et al., 2021).

6.5. Study limitations

The current study had the following limitations; firstly, the observation periods were cut short due to the limited time available to the researcher to complete the work. The researcher acknowledges there might have been other interesting things that happened outside the observation number of that could have influenced the findings of this study.

The study was also conducted after the second wave in Ghana and that could account for the very low adherence and poor implementation in the facilities.

Lastly, the study limited the number of facilities to only the district hospitals due to the researcher's limited time to complete the work. It will however be interesting to see the implementation situation of Health Centres and CHPs compounds in the district.

CHAPTER SEVEN: CONCLUSION AND RECOMMENDATIONS

7.1 Conclusions

Healthcare and non-healthcare workers' adherence to COVID-19 prevention protocols in the health facilities was low. Adequate knowledge on COVID-19 prevention protocols in the district did not positively influence adherence as expected. The study showed wide gaps in adherence to COVID-19 prevention protocols across healthcare and non-healthcare workers at risk of non-compliance with COVID-19 prevention protocols. In addition, the study concludes that the facilities in the district have inadequate prevention protocol materials as disposable towels and tissue including loud reminders to practice hand hygiene were barely seen during the observation. Soap or soap solution, dust bins, and hand sanitizers at vantage points were also seen once (3.45%) during the period of observation in the health facilities. Knowledge, enforcement, and socio-demographic factors such as ethnicity are factors that influence non-healthcare workers' adherence to COVID-19 prevention protocols, according to this study. Implementers' efforts of ensuring adherence are also hampered by the burden of work, lack of logistics, finances, lack of cooperation from patients and their relatives, facility environment, lack of security personnel, and poor motivation and empowerment for implementers.

The provision of an adequate supply of COVID-19 prevention protocol materials/logistics coupled with behavioral change interventions could improve adherence and effective implementation of the COVID-19 prevention protocols in the facilities and the district at large.

7.2 Recommendations

Recommendations for Policy

1. The government of Ghana through the Ministry of Health should sustain effective stakeholder engagement on the COVID-19 prevention protocols to ensure they are being enforced.
2. Ghana Health Service should provide support systems to implementers who face or get into trouble while enforcing the COVID-19 prevention protocols to improve consistency with the policy.

Recommendations for practice

1. Local authorities, media, and other institutions like NHRC should continue to carve out behavioral change messages to augment the knowledge that is being shared.
2. Health facility managers should invest in empowering and motivating implementers to enforce the COVID-19 protocols strictly and consistently within the health facilities in the district.
3. The government of Ghana should make funds available for the basic needs of the health facilities by ensuring National Health Insurance tariffs are paid consistently to reduce the financial constraint on facility internal generated funds (IGF).

Recommendations for future research

1. Further research to explore beliefs and perceptions of non-healthcare workers around COVID-19 should be conducted in the district to help improve implementers understanding of non-healthcare workers attitude towards the preventive protocols.

2. The protocols themselves should be evaluated to determine how they influence new affections of COVID-19.

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APPENDICES

Appendix 1: Participant Information Sheet

INFORMATION SHEET FOR STUDY PARTICIPANTS (NON-HEALTHCARE WORKERS)

Exit interviews

Study Title: Assessment of the implementation of COVID-19 prevention protocols in selected health facilities in the Kassena Nankana District of Ghana.

Introduction

My name is Daniel Enos K. Sekwo, a student from the School of Public Health**,** University of Ghana Legon. As a requirement for the award of a Master of Science in Public Health Monitoring and Evaluation degree, I am conducting this study. I will lead the conduct of this study under the supervision of Prof. Paulina Tindana**.** This study is funded by the H3Africa CEBioGen project. You are kindly invited to take part in this study.

Background and rationale of the study

The coronavirus pandemic is a major public health concern for every government in the world. World health bodies such as the WHO, US-CDC, and the Africa CDC established some protocols to help contain the spread of the virus across the world. Governments including the government of Ghana adopted and promoted these prevention protocols through several interventions and investments in the health and other sectors. The persistent surge in cases suggests a reduced Adherence to the prevention protocols. This study is therefore designed to assess the implementation of the prevention protocols particularly in health facilities which are reported as one of the places of transmission; to understand what the challenges are in implementing these protocols in health facilities and to determine the factors that make it easy or difficult for facility users to observe the prevention protocols.

Nature of study

This is a cross-sectional study that employs mixed methods of gathering data from healthcare workers and non-healthcare workers. All non-healthcare workers will be observed, to determine the level of Adherence to the prevention protocols and later consented to participate in an exit

survey to understand the factors that influence their adherence and the challenges they face with the COVID-19 prevention protocols at the health facility.

Who qualifies to take part in this study?

The study is being implemented in the two major facilities in the Kassena Nankana District of Ghana. Participants will include any person within the selected facility at the period of observation who is eighteen (18) years and above and has either come to receive care or brought someone to receive care and has been successfully observed. A potential participant must go through the informed consent process and voluntarily agree to participate in the survey.

You have been invited to take part in the study because you meet the above criteria.

Right to refuse or withdraw from the study

Participation in the survey is completely voluntary. As a potential participant, you have the right to choose not to participate in the study, withdraw consent at any time, and refuse to answer any question in the process of the interview if you so wish. You will not be adversely affected if you take a decision not to participate or withdraw during the interview. You will also not lose any health care services that you are entitled to if you refuse to be part of the study. Sufficient time will be given to all study participants to decide their participation in the study. However, a nonresponse from any participant for three follow-ups after the start of the consent process will mean refusal to take part in the study.

The role and responsibilities of study participants

The study participants for the survey will be interviewed at the end of their visit to the facility as they exit, to share their knowledge, perceptions, and experiences on COVID-19 prevention protocols**,** factors that influence their adherence as well as their challenges with obeying the protocols in the health facility.

Duration

The survey is expected to last for about 30minutes.

Benefits of the research to participants

There are no direct benefits to you for taking part in this study. However the information you will provide will influence public health policy which may benefit the whole community. Also, your views will help identify the factors affecting the implementation of COVID-19 prevention protocols in health facilities and also provide information on the challenges therein, to support the fight against the virus.

Risks and discomfort as a participant

You will not be exposed to any physical danger for taking part in this study apart from the time that you will spend answering the questions. We estimate that the survey may take about 30minutes of your time but we will ensure we will not hold you longer than 30minutes to avoid further inconveniences and reduce the discomfort participation may cause you.

How will confidentiality be assured?

Participants will not be identified by name and all the responses from the survey will be kept securely in a password-protected cloud server. Your name will not be written in any report or publication from this study. The information provided will be used for the intended purposes only.

Will participants be paid or given any gift in this study?

You will not be paid any money for taking part in the study.

Feedback to participants

There would be no direct feedback to participants. The recommendations from the study findings however would be made available to the War Memorial Hospital and the Paga District Hospital for adoption to improve the implementation of the prevention protocols.

Will participants be given an information sheet and consent form?

If you agree to take part in this study, you will be given copies of the information sheet and consent forms to sign or thumbprint before the survey.

Contact information if participants have further questions about the study

If you have further questions, kindly contact **Mr. Daniel Enos Sekwo**, School of Public Health, University of Ghana, Legon on telephone number **0540465031**, or **Prof. Paulina Tindana**

(0544905490) also at the School of Public Health, University of Ghana, Legon. If you have an ethical issue about the study or questions about your rights as a participant, you may contact: **Madam Nana Abena Kwaa Ansah Apatu (+233-50-3539896)**, the administrator, Ghana Health Service Ethics Review Committee.

INFORMATION SHEET FOR STUDY PARTICIPANTS (HEALTHCARE WORKERS)

In-depth Interviews (IDIs)

Study Title: Assessment of the implementation of COVID-19 prevention protocols in selected health facilities in the Kassena Nankana District of Ghana.

Introduction

My name is Daniel Enos K. Sekwo, a student from the School of Public Health**,** University of Ghana Legon. As a requirement for the award of a Master of Science in Public Health Monitoring and Evaluation degree, I am conducting this study. I will lead the conduct of this study under the supervision of Prof. Paulina Tindana**.** This study is funded by the H3Africa CEBioGen project. You are kindly invited to take part in this study.

Background and rationale of the study

The coronavirus pandemic is a major public health concern for every government in the world. World health bodies such as the WHO, US-CDC, and the Africa CDC established some protocols to help contain the spread of the virus across the world. Governments including the government of Ghana adopted and promoted these prevention protocols through several interventions and investments in the health and other sectors. The persistent surge in cases suggests a reduced Adherence to the prevention protocols. This study is therefore designed to assess the implementation of the prevention protocols particularly in health facilities which are reported as one of the places of transmission; to understand what the challenges are in implementing these protocols in health facilities and to determine the factors that make it easy or difficult for facility users to observe the prevention protocols.

Nature of study

This is a cross-sectional study that employs mixed methods of gathering data from healthcare workers and non-healthcare workers. All healthcare workers will be observed, to determine the level of Adherence to the prevention protocols and later conveniently consented to participate in IDIs to understand the factors that influence their adherence and the challenges they face with implementing the COVID-19 prevention protocols at the health facility.

Who qualifies to take part in this study?

The study is being implemented in the two major facilities in the Kassena Nankana District of Ghana. Health workers at the facility either in the ward or outside who are available and willing to grant an interview will be enrolled after going through the informed consent process.

You have been selected to take part in this study as a healthcare worker because you are directly involved in ensuring adherence to prevention protocols in the facility.

Right to refuse or withdraw from the study

Participation in the survey is completely voluntary. As a potential participant, you have the right to choose not to participate in the study, withdraw consent at any time, and refuse to answer any question in the process of the interview if you so wish. You will not be adversely affected if you take a decision not to participate or withdraw during the interview. Sufficient time will be given to all study participants to decide their participation in the study. However, a nonresponse from any participant for three follow-ups after the start of the consent process will mean refusal to take part in the study.

The role and responsibilities of study participants

Participants of the qualitative interviews will be contacted and scheduled at their convenience. Each participant will be asked to share their knowledge on COVID-19 prevention protocols, the factors that support or inhibit adherence, and the challenges they face in implementing the protocols in the health facility.

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Duration

The survey is expected to last for about 30-to-45minutes.

Benefits of the research to participants

There are no direct benefits to you for taking part in this study. However the information you will provide will influence public health policy which may benefit the whole community. Also, your views will help identify the factors affecting the implementation of COVID-19 prevention protocols in health facilities and also provide information on the challenges therein, to support the fight against the virus.

Risks and discomfort as a participant

You will not be exposed to any physical danger for taking part in this study apart from the time that you will spend answering the questions. We estimate that the interview may take about 30-to-45minutes of your time but we will ensure the discussion is lively to avoid further inconveniences and reduce the discomfort participation may cause you.

How will confidentiality be assured?

Participants will not be identified by name on any transcript from the data gathered. All transcripts and audios will be saved on a password-protected computer. These and the transcripts generated from them will be destroyed two years after the award of the degree. Your name will not be written in any report or publication from this study. The information provided will be used for the intended purposes only and cannot be traced to any individual healthcare worker.

Will participants be paid or given any gift in this study?

You will not be paid any money for taking part in the study.

Feedback to participants

There would be no direct feedback to participants. The recommendations from the study findings however would be made available to the War Memorial Hospital and the Paga District Hospital for adoption to improve the implementation of the prevention protocols.

Will participants be given an information sheet and consent form?

If you agree to take part in this study, you will be given copies of the information sheet and consent forms to sign or thumbprint before the interview.

Contact information if participants have further questions about the study

If you have further questions, kindly contact **Mr. Daniel Enos Sekwo**, School of Public Health, University of Ghana, Legon on telephone number **0540465031**, or **Prof. Paulina Tindana** (0544905490) also at the School of Public Health, University of Ghana, Legon. If you have an ethical issue about the study or questions about your rights as a participant, you may contact: **Madam Nana Abena Kwaa Ansah Apatu (+233-50-3539896)**, the administrator, Ghana Health Service Ethics Review Committee.

Appendix 2: Consent Form

CONSENT FORM

STUDY TITLE: Assessment of the implementation of COVID-19 prevention protocols in selected health facilities in the Kassena Nankana District of Ghana

PARTICIPANTS' STATEMENT

I acknowledge that I have read or have had the purpose and contents of the Participants' Information Sheet read and all questions satisfactorily explained to me in a language I understand (……..). I fully understand the contents and any potential implications as well as my right to change my mind (i.e. withdraw from the research) even after I have signed this form.

I voluntarily agree to be part of this research.

Name of Participant……..

Participants' Signature ……...OR Thumb Print……

Date:…….

INTERPRETERS' STATEMENT

I interpreted the purpose and contents of the Participants' Information Sheet to the aforenamed participant to the best of my ability in the (……*name of language*) language to his proper understanding.

All questions, appropriate clarifications sorted by the participant, and answers were also duly interpreted to his/her satisfaction.

Name of Interpreter……

Signature of Interpreter…….. OR Thumb Print …….....

Date:……

Contact Details

STATEMENT OF WITNESS

I was present when the purpose and contents of the Participant Information Sheet was read and explained satisfactorily to the participant in the language he/she understood (….*name of language*)

I confirm that he/she was allowed to ask questions/seek clarifications and the same were duly answered to his/her satisfaction before voluntarily agreeing to be part of the research.

Name:……

Signature…….... OR Thumb Print …….....

Date:……

INVESTIGATOR STATEMENT AND SIGNATURE

I certify that the participant has been given ample time to read and learn about the study. All questions and clarifications raised by the participant have been addressed.

Researcher's name……

Signature …….

Date……

Appendix 3: Data Collection Tool (Questionnaire)

TITLE*: Assessment of the implementation of COVID-19 prevention protocols in selected health facilities in the Kassena-Nankana District of Ghana*

Questionnaire ID…….. Date of interview …… Time …….

Name of Interviewer……..... Contact of respondent | | | | | | | | | | |

Check the appropriate response(s)

SECTION 1: SOCIO-DEMOGRAPHIC INFORMATION OF PARTICIPANT		
No.	**Questions**	**Responses**
1.	Age at last birthday (Years)	_____
2.	What is your sex?	1. Male 2. Female
3.	What is the highest level of school you completed?	1. No formal education 2. Primary 3. Middle/JHS 4. SHS 5. Tertiary and above
4.	Ethnicity	1. Kassem 2. Nankam 3. Builsa 4. Ga-Adangbe 5. Sissala 6. Other specify_____
5.	What is your marital status?	1. Single 2. Co-habiting/Married 3. Separated/divorced 4. Widowed 5. Others (specify)

6.	What is your employment status?	1. Unemployed 2. Employed 3. Self-employed
7.	What is your religion?	1. Traditional 2. Christianity 3. Islam 4. Others

SECTION 2: ADHERENCE TO COVID-19 PREVENTION PROTOCOLS		
No.	**Questions**	**Responses**
	Which of the following measures have you taken to prevent infection from COVID-19? Please indicate for all measures below whether you have already taken them. Adapt to national recommendations: Specify to the degree possible, depending on national recommendations	
	Face Mask adherence in the facility	
8.	Was respondent wearing a nose mask? ***(NB: Do not ask; observe and record)***	1. Yes 2. No
9.	Did anyone tell/remind you to wear a nose mask in the facility?	1. Yes 2. No (if No, skip Q11)
10.	If yes, who?	1. Security 2. Health worker 3. Posters/cue to action 4. Other specify……
11.	Do you have a nose mask?	1. Yes 2. No (if No, skip to hand hygiene)
12.	Did you wear a nose mask when you arrived at the facility?	1. Yes 2. No (if Yes, skip Q14)
13.	If no, why?	1. Don't have nosemask 2. Nose mask is torn 3. I forgot

		4. Feel uncomfortable 5. Can't afford one 6. Other specify……
14.	Did you wear a nose mask, covering your mouth and nose throughout your period in the facility?	1. Yes 2. No (if Yes, skip Q16)
15.	If no, why?	1. I took it off for Doctor to check me 2. Discomfort around ears 3. Breathing difficulties 4. I took it off to talk to others 5. Other specify ……
Hand washing/Hand hygiene adherence in the facility		
16.	Did anyone ensure you washed your hands in the facility?	1. Yes 2. No (if No, skip Q18)
17.	If yes, who?	1. Security 2. Health worker 3. Posters/cue to action 4. Other specify……
18.	Did you wash your hands with soap and water before entering the facility?	1. Yes 2. No (if Yes, skip Q20)
19.	If no, why?	1. No handwashing facility 2. No soap 3. No water 4. Other specify…….
20.	Did you wash your hands at any point within the facility or at various units you visited?	1. Yes 2. No

21.	Did you wash when exiting?	1. Yes 2. No
22.	Did you sanitize to your hands within the facility?	1. Yes 2. No (if Yes, skip Q24) (if No, skip Q25)
23.	If no why?	1. Don't have sanitizer 2. Did not see any/have access to any 3. Cannot afford 4. Did not need to 5. Other specify ….
24.	If yes, who provided the sanitizer you used	1. Self 2. Facility 3. Healthcare worker 4. Other specify……
Social distancing adherence in the facility		
25.	Did anyone ensure you observed social distancing in the facility?	1. Yes 2. No (if No, skip Q24)
26.	If yes, who?	1. Security 2. Health worker 3. Posters/cue to action 4. Other specify……
27.	Did you avoid close contact/keep a distance with other people in the facility?	1. Yes 2. No (if Yes, skip Q29)
28.	If no, why?	1. They are my friends and family 2. No space to avoid others

		3. Other specify……..
29.	Were the spaces at the various units you visited enough and well ventilated for you to practice social distancing?	1. Yes 2. No (if Yes, skip Q28)
30.	If no, which unit did you find it difficult to observe social distancing	1. OPD department 2. Records department 3. Pharmacy department 4. Laboratory department 5. Ward ***(Circle all respondent mentions)***
31.	Did the seating arrangement at the various units you visited ensure social distancing?	1. Yes 2. No

SECTION 3: FACTORS INFLUENCING THE ADHERENCE TO COVID-19		
Source of Information/Knowledge on COVID-19		
32.	Which of the following sources do you get information about the coronavirus from? (Choose many as applicable)	1. Television 2. Radio 3. Health care professional 4. Family and/or friends 5. Social media (e.g. Facebook, Twitter, YouTube, WhatsApp) 6. Official, government press releases (Fellow Ghanaians) 7. Religious announcement 8. Other Specify……..
33.	Which is your trusted source of information on coronavirus?	1. Television 2. Radio 3. Health care professional 4. Family and/or friends 5. Social media (e.g. Facebook, Twitter, YouTube, WhatsApp) 6. Official, government press releases (Fellow Ghanaians) 7. Religious announcement 8. Other Specify……..

No.	**Other Questions**	**Responses**	
		Yes	No

	Knowledge/perception on transmission and prevention		
34.	Handwashing or hand sanitizing can prevent COVID-19		
35.	Wearing a face mask can prevent COVID-19		
36.	Social distancing can prevent COVID-19		
37.	Avoiding crowded places can prevent COVID-19		
38.	Covering the nose and mouth while coughing can prevent COVID-19		
39.	Avoiding touching of eyes, nose and mouth can prevent COVID-19		

Thank you for participating in this study

Part B: Observation Checklist

Study Title: ***Assessment of the implementation of COVID-19 prevention protocols in selected health facilities in the Kassena Nankana district of Ghana***

This checklist will be used to observe both healthcare workers and non-healthcare workers to know their compliance and adherence to the COVID-19 prevention protocols within the health facilities.

No.	Section A: General Information	Possible Response
1.	Time of observation	…… …….
2.	Designation	1. Healthcare worker outside the ward 2. Non-healthcare worker outside the ward 3. Inpatient 4. Ward staff 5. Non-healthcare workers in the ward
3.	Sex	1. Male 2. Female
4.	Age category	1. Child 2. Youth 3. Adult 4. Aged
5.	Physical disability	1. Yes 2. No
6	Which of these is the person seen doing at the time of observation a. Wearing a nose mask b. Washing/rubbing hands c. Social/physical distancing d. Shaking hands e. Touching eyes and face	*Check all that apply* a. 1. Yes 2. No b. 1. Yes 2. No c. 1. Yes 2. No d. 1. Yes 2. No e. 1. Yes 2. No

No.	Section B: COVID-19 Prevention protocols	Responses
	Nose Mask	
7.	Is the person wearing a nose mask?	1. Yes 2. No
8	At what point?	1. Wore it before coming to the facility 2. Wore it upon entering the facility

		3. Wore it after was told to wear 4. Wore it in the ward
9.	Is the person wearing it properly? (Covering nose and mouth and chin)	1. Yes 2. No
10	How clean does it look?	1. Neat 2. Dirty 3. Old 4. New
11.	What type of nose mask?	1. Surgical mask 2. Cloth mask 3. Others
12.	Does the person take off the nose mask when talking to others?	1. Yes 2. No
13.	Does the person keep touching the nose mask on their face?	1. Yes 2. No
	Hand Hygiene	
14	Is the person seen washing hands under running water for at least 20 seconds?	1. Yes 2. No
15	What does the person do if the facility does not have soap and water available?	1. Washes hands with only water 2. Uses personal water to wash hands 3. Uses alcohol rub 4. Do nothing and moves on 5. N/A
16	Is the person seen using any alcohol hand rubs?	1. Yes 2. No
17	Does the person own a personal alcohol-based rub?	1. Yes 2. No 3. Can't tell
18	Does the person wash/rub hands after touching surfaces such as folders, beds, or tables and chairs?	1. Yes 2. No
	Social/Physical Distancing	
19	Does the person look out for demarcated places to sit?	1. Yes 2. No
20	Does the person maintain a physical distance of about 2meters apart from others in the ward or at the facility?	1. Yes 2. No
21	Is the person seen shaking hands with others?	1. Yes 2. No
22	Does the person try to avoid crowded spaces/places in the facility?	1. Yes 2. No

23	Is the person seen talking closely with others with or without a face mask on?	1. Yes 2. No

No.	Section C. Other General Observations	Responses
24	Does the person touch their eyes and face?	1. Yes 2. No
25	Does the person pay any attention to displayed cues to action or other posters at the ward or facility?	1. Yes 2. No
26	Does the person help others to observe any of the protocols?	1. Yes 2. No
	Section D: Closure and Comments	
27	Does the person wear a nose mask throughout their observation period in the ward/facility?	1. Yes 2. No
28	Does the person wash/rub hands intermittently throughout their observation period in the ward/facility?	1. Yes 2. No
29	Does the person maintain social/physical distancing throughout their period of observation in the ward or facility?	1. Yes 2. No
30	What other interesting things did you observe?	(not more than 300 words)
31	Name of observer	…….
32	Time observation ended	……

Part D: IDI Guide

Study Title: Assessment of the implementation of COVID-19 prevention protocols in selected health facilities in the Kassena Nankana District of Ghana

IDI GUIDE FOR HEALTHCARE WORKERS **Time of interview: ……**

Introduction

- Welcome the participant and briefly describe the objectives of the study
- Review Study Info Sheet & provide a copy of Consent Form for signature
- Outline the format of the interview

Section A: Background of respondent

IDI No	Sex	Age	Marital Status	Religion	Educational level	The cadre of health worker	Length of service	Monthly income	No of hours of work per day	Training on IPC

Section B: Knowledge and perception about the coronavirus disease

1. Please tell me about the coronavirus disease
   Probe: How did you hear about it? Did you have any training on it?
2. What do you think of the assertion that there is enough information about the disease for everyone to understand it? Probe: Misinformation to cause panic?
3. Please tell me your personal views about the coronavirus situation in the district
4. As a healthcare worker, what do you think about this disease and how the health system is responding to it? Probe: Measures of response by the government and GHS you know?

Section C: Knowledge about prevention protocols

5. Please tell me about the coronavirus disease prevention protocols you know?
6. Which of them do you practice? Probe: Why?
7. Which of them do you not practice? Probe: Why?
8. Which other measure can contribute to infection prevention during pandemics?

9. What have you done to enable your clients/staff to know and practice these prevention protocols?

Section D: Adherence

10. Please tell me about the level of compliance with COVID-19 prevention protocols within the facility
11. What can you tell me about your compliance with each of the following a) Nose mask
    b) Social/physical distancing
    c) Hand hygiene through washing and use of alcohol rubs
12. Why do you/do you not comply?
13. What could be done to increase the level of adherence among health workers in the facility? Probe: Non-healthcare workers?

Section E: Factors that influence adherence

14. What are the things that make it easy for you to comply? Probe: How different are these factors for non-healthcare workers?
15. What are the things that affect your ability to comply? Probe: How different are these factors for non-healthcare workers?
16. What other factors affect Adherence to the COVID-19 prevention protocols in the health facility?

Section F: Challenges with implementing COVID-19 prevention protocols in the health facility

17. What makes it easy to implement the COVID-19 prevention protocols in the facility?
18. What makes it difficult to implement the COVID-19 prevention protocols in the facility?
19. How do you navigate through these challenges?
20. What is the way forward?

Section G: Recommendations/closure

21. How would you advise the GoG through the MoH and the GHS to implement the COVID-19 prevention protocols in health facilities to be successful?
22. What would you recommend as the best way to reduce new infections and contain the spread of the coronavirus?
23. Is there anything else about the coronavirus disease and the implementation of the prevention protocols you will like to add?

Thank you for participating.

Appendix 4: Ghana Health Service Ethical Approval Letter

GHANA HEALTH SERVICE ETHICS REVIEW COMMITTEE

In case of reply the number and date of this Letter should be quoted.

My Ref. GHS/RDD/ERC/Admin/App 21/21
Your Ref. No.

Research & Development Division
Ghana Health Service
P. O. Box MB 190
Accra
Digital Address: GA-050-3303
Mob: +233-50-3539896
Tel: +233-302-681109
Fax + 233-302-685424
Email: ethics.research@ghsmail.org
21st June, 2021

Daniel Enos Kwopia Sekwo
Navrongo Health Research Centre,
Box 114 Navrongo, UER

The Ghana Health Service Ethics Review Committee has reviewed and given approval for the implementation of your Study Protocol.

GHS-ERC Number	**GHS-ERC: 024/05/21**
Study Title	Assessment of the Implementation of COVID-19 Prevention Protocols in Selected health Facilities in the Kassena Nankana District of Ghana.
Approval Date	21st June, 2021
Expiry Date	20th June, 2022
GHS-ERC Decision	**Approved**

This approval requires the following from the Principal Investigator

- Submission of a yearly progress report of the study to the Ethics Review Committee (ERC)
- Renewal of ethical approval if the study lasts for more than 12 months,
- Reporting of all serious adverse events related to this study to the ERC within three days verbally and seven days in writing.
- Submission of a final report after completion of the study
- Informing ERC if study cannot be implemented or is discontinued and reasons why
- Informing the ERC and your sponsor (where applicable) before any publication of the research findings.

You are kindly advised to adhere to the national guidelines or protocols on the prevention of COVID -19

Please note that any modification of the study without ERC approval of the amendment is invalid.

The ERC may observe or cause to be observed procedures and records of the study during and after implementation.

Kindly quote the protocol identification number in all future correspondence in relation to this approved protocol.

SIGNED.....
Dr. James Akazili
(Head, Ethics & Research Management Department)

Cc: The Director, Research & Development Division, Ghana Health Service, Accra