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ASSESSMENT OF OCCUPATIONAL HEALTH AND SAFETY COMPLIANCE AMONG HEALTHCARE PROFESSIONALS AT THE KORLE BU TEACHING HOSPITAL

BY

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DECLARATION

I, Edward Anyinasong hereby declare that apart from references to other people's work which I have duly acknowledged, this thesis/dissertation is a result of my independent work produced from research undertaken under supervision

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DEDICATION

To my wife Elizabeth Anyinasong, my Son Welam Anyinasong, my late dad Mr. Simon Anyinasong, my mother and my siblings and the entire Anyinasong family

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ABSTRACT

Background

The onset of the coronavirus disease-19 (COVID-19) pandemic has heightened global interest in occupational health and safety in healthcare settings. Occupational safety and health (OSH) is a multidisciplinary area that deals with the safety, health, and well-being of workers. One major category of the global workforce whose occupational health and safety are in jeopardy are healthcare workers (HCWs) this has become great concern because of the rise in infection among health care workers because of the Covid 19 pandemic.

General Aim

To assess compliance to occupational health and safety guidelines, knowledge and factors that influence compliance among healthcare workers at the Korle-Bu Teaching Hospital.

Methodology

The study was a cross-sectional study by means of a quantitative research approach. A total of 346 responses (response rate) resulted as sample size from different healthcare practitioners working within the various Korle Bu Teaching hospital departments were recruited to participate in the study. The study employed the use of proportionate stratified sampling technique to select the number of participants from each staff category, simple random sampling was then used to select final participants staff. A standard interviewer-administered questionnaire was employed for data collection. Socio-demographic data were analyzed using descriptive statistics while standard multiple linear logistic regression was used to analyze factors associated with compliance with standard precautions.

Results

In this study, 66.4% of the respondents had a high knowledge of occupational hazards and safety precautions. The rate of compliance to standard precautions in this study was moderately above average 60.8%. The presence of factors such as PPEs and other Safety equipment, and Workplace safety climate significantly contributed to the compliance with occupational health precautions.

Conclusion

It was clear from the findings of this study that most respondents (66.4%) had good knowledge of occupational hazards and safety precautions with 60.8% of the respondents comply with safety guidelines. Management of healthcare institutions should increase its focus with respect to availability and accessibility of PPEs, training, support, and giving feedback for safety practices to ensure compliance with standard precautions.

TABLE OF CONTENT

LIST OF ABBREVIATIONS

UPs	Universal Precautions
SPs	Standard Precautions
HWCs	Healthcare workers
WHO	World Health Organization
HCPs	Healthcare professionals
PPE	Personal protective equipment
OHS	Occupational Health and Safety
MOH	Ministry of Health
OSHA	Occupational Health and Safety Administration
CDC	Centre for Disease Control
BBFs	Blood and Body Fluids

CHAPTER ONE

1.0 INTRODUCTION

1.1 Background

The onset of the coronavirus disease-19 (COVID-19) pandemic has heightened global interest in occupational health and safety measures within healthcare settings. The interdisciplinary area of occupational health is responsible for the protection, health, and well-being of all employees (Faller *et al*., 2018). One major category of the global workforce whose occupational health and safety is in jeopardy are healthcare workers (HCWs), they deliver care to patients in what would be regarded as the most hazardous workplaces on the planet (Moore & Kaczmarek, 1990; Crutcher *et al*., 1991). Their lives, safety, and well-being are threatened by occupational hazards that include biological), chemical, physical, ergonomic , psychosocial and electrical hazards (WHO, 2018). During the severe acute respiratory syndrome (SARS) outbreak in 2003, 19.5% of the reported cases (917/4698) occurred among healthcare workers (Jiang, 2016). As another example, sharps injuries to healthcare personnel led to 16,000 cases of hepatitis C virus (HCV) transmission, 66,000 cases of hepatitis B virus (HBV), and 1,000 cases of human immunodeficiency virus (HIV) infestation during the year 2000 (Rapiti *et al*., 2014). By the year 2030, these infections would be responsible for 145 untimely deaths due to HCV, 261 untimely deaths due to HBV, and 736 premature deaths due to HIV. (Rapiti *et al*., 2014). Health workers have also been reported to endure substantial emotional repercussions, including depressive episodes, pressure from family members, tearfulness, affective disorders, panic attacks, post-traumatic stress disorder (PTSD) and increased anxiety (Hanmore *et al*., 2013; Wicker *et al*., 2014).

Consequently, guidelines aimed at reducing the risks of HCWs to these occupational hazards, previously referred to as universal precautions, but more recently, standard precautions (SPs), have been developed (Garner, 1996; Kermode *et al*., 2005). Examples of these include wearing of goggles, gowns, gloves, and face masks, as well as practice of good hand hygiene (Madan *et al*., 2001; Gammon *et al*., 2008). Adherence to such guidelines, and their enforcement thereof, promote a safe work environment (Nwankwo & Karanja 2017).

Noteworthy, though, safety standards of the healthcare systems of countries in Africa, as well as those of other developing countries, have been low, and this had been the case even prior to the onset of the COVID-19 pandemic (Reuter *et al*., 2014; Oleribe *et al*., 2019; Onigbinde *et al*., 2020). In these regions, instituting standard measures has proven to be a substantial hurdle for a number of healthcare employees due to a lack of resources, subpar safety practices, poor training, a lack of knowledge concerning the risks of poor infection control measures and inadequate institutional commitment regarding safety practices, which jeopardizes the wellbeing of health care workers, and raises workers risk to blood-borne microbes (Sagoe-Moses *et al*, 2001; Kermode *et al*., 2005; Nwankwo *et al*., 2011; Akinboro *et al*., 2012; Yenesew & Fekadu, 2014).

Workplace health and safety regulations exist in Ghana, and that pertains to all health-related agencies and governing bodies. Ghana's policy incorporates its health regulations as well as other OHS standards across the globe, providing a basis for the management of workplace health and safety in order to guarantee the health and safety of health-care personnel. (Ministry of Health, 2010). Within the context of the OHS policy, you can find a fantastic infection prevention and control system in place (IPC). Two major problems, however, pose a threat to HCWs' occupational health and safety in the nation: inadequate compliance with and knowledge of Standard precautions (Ministry of Health, 2015; Squeri *et al*., 2016). As an example, a study done by the Ghana Health

Service (GHS) among female health workers in selected health facilities revealed that only 11.9% of the respondents were aware of safety guidelines in their workplace (GHS, 2016)

As the world is currently in a state of public health emergency, created by the ongoing COVID-19 pandemic, efforts need to be directed at improving occupational health of healthcare professionals in the country, because of the integral role they play in maintaining the health of the general population. It is therefore imperative to explore strategies that can help improve compliance to SPs among HCWs in the country.

1.2 Problem Statement

Healthcare workers have a higher odd of acquiring a variety of nosocomial diseases (Bellei *et al*. 2007; Macintyre *et al*., 2014). Annually, about 3 million Health workers out of 35 million around the globe are exposed to blood-borne infections by sharps injuries ,2 million with Hepatitis B , 0.9 million with Hepatitis C, and 0.17 million with HIV Aids (WHO, 2012).

In sub-Saharan Africa, the prevalence of blood-borne pathogens are relatively higher, and the healthcare infrastructure is poorer, in comparison to other regions (Murray & Lopez, 1997; Institute of Medicine, 2001), putting HCWs in these regions at an increased risk of exposure to occupational infections (Nsubuga & Jaakkola, 2005; Bekele *et al*., 2015). Workplace contamination is responsible for 11.8 % of Hepatitis B, 2.8 % of Hepatitis C, and 5.1% of HIV cases in the region (Rapiti *et al*., 2014). These infections are associated with high morbidity, low quality of life, and reduced life expectancy (Leigh *et al*., 2007). In the United States of America, the cost of occupational health injuries among nursing aides and orderlies is about 2.2 billion dollars, and that of registered nurses is 900 million dollars (Waehrer et al., 2005). Beside these,

they are also associated with major secondary psychological effects, (Hanmore *et al*., 2013; Wicker *et al*., 2014).

The threat to HCWs' health and safety rose exponentially following the inception of the COVID-19 pandemic in the latter part of 2019. Thus far, the pandemic has been fatal – by the end of July 23, 2021, the number of confirmed COVID-19 cases was 192,284,207, along with a death toll of 4,136,518 (https://covid19.who.int). In Ghana, the current number of confirmed COVID-19 cases is 100,250, along with a death toll of 819, and has seen an upward trend since the middle of June 2021, owing to the general public's blatant disregard for the established COVID-19 protocols. HCWs are frontline workers in the management of the pandemic. Those who work in the main COVID-19 treatment sites and those who work outside these sites are at a higher risk of acquiring and dying from COVID-19 than are members of the general population. In fact, WHO statistics indicate that more than 115,000 HCWs have so far contracted and died from COVID-19 (https://covid19.who.int).

Given the existing public health emergency presented by the pandemic and the need to sustain the health of HCWs so they can continue managing the public health crisis, it is important to improve their compliance to standard precautions. Poor knowledge about standard precautions has been identified as a key determinant of SP compliance (Albano *et al*., 2014; Geberemariyam *et al*., 2018; Assefa *et al*., 2020). To this end, evaluating the knowledge and compliance with SPs among HCWs in the country needs to be top on the agenda of public health efforts.

1.3 Justification of the Study

Despite the importance of research assessing compliance with safety guidelines and factors influencing it among health workers, only a few have been undertaken in the state. This exposes significant knowledge gaps that could have been valuable in the development of targeted public

health policies that provide practicable methods to address compliance with Standard precautions between all health institutions to protect the workers working in these institutions. This study seeks to assess Healthcare workers' knowledge of Standard precaution, compliance, and factors impacting compliance with SP at Ghana's premier Teaching Hospital (Korle Bu Teaching Hospital) in other to close the stated knowledge gap in the country.

1.4 General Objective

To assess compliance to occupational health and safety guidelines ,knowledge and factors that influence compliance among healthcare workers at the Korle-Bu Teaching Hospital

1.4.1 Specific Objectives

i. To evaluate the knowledge of healthcare workers at the Korle-Bu Teaching Hospital regarding occupational health and safety guidelines.

ii. To determine the healthcare workers' extent of compliance with standard precautions.

iii. To determine factors influencing the healthcare workers' compliance with standard precautions.

1.5 Research Questions

The study sought to answer the following questions:

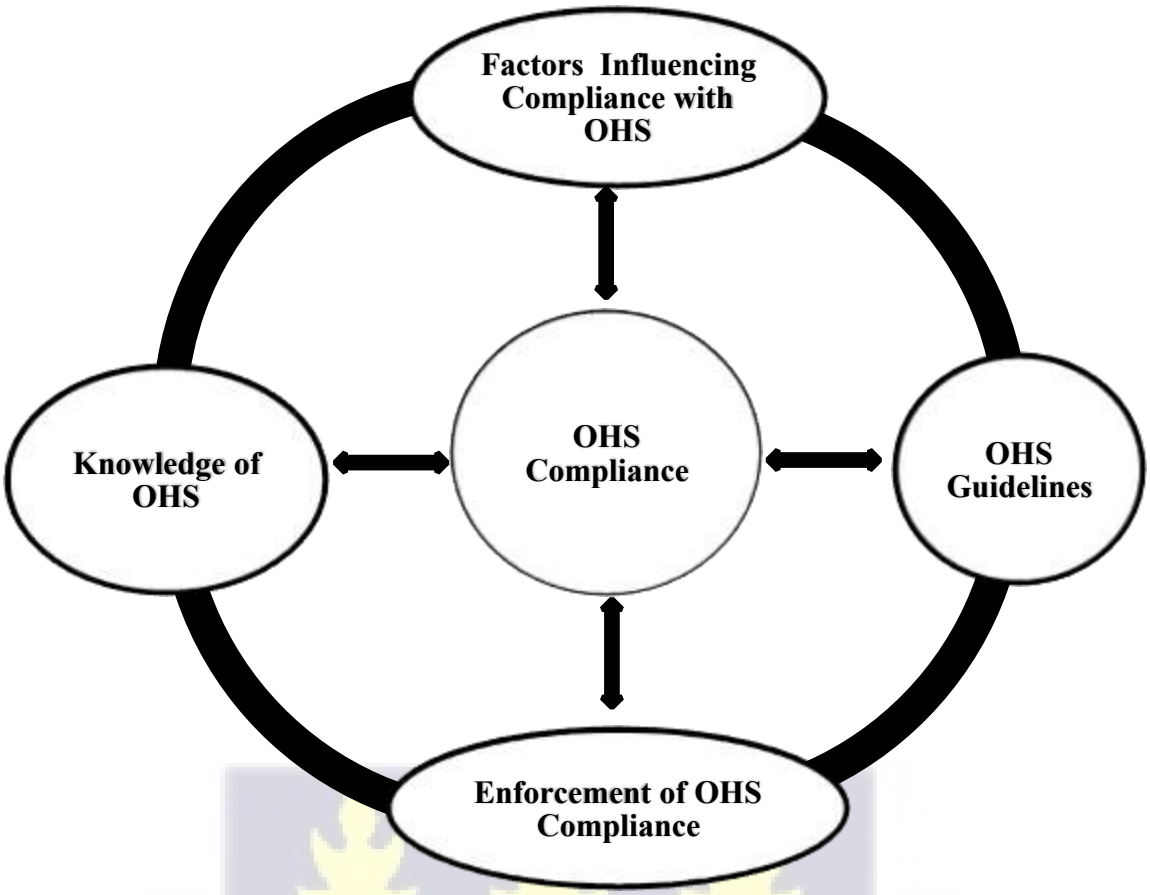
i. What is the knowledge level of healthcare workers at the Korle-Bu Teaching Hospital regarding occupational health and safety guidelines?

ii. To what extent does healthcare workers comply with standard precautions?

iii. What were the factors influencing the healthcare workers' compliance with standard precautions?

1.6 Conceptual Framework

Literature on occupational health and safety has revealed that healthcare workers and other workers' occupational health and safety involves an interplay between workers' knowledge of, and compliance with SPs, and enforcement of SPs. To illustrate, both healthcare staff and others are required to have sufficient knowledge and awareness of the risks inherent in the healthcare system, which would affect their attitude and attitudes about workplace hazards, resulting in strict compliance with occupational health and safety guidelines. This will necessitate the proper use of equipment to protect healthcare personnel when performing their duties. Also factors such as training, management feedback for safety precautions, safety climate, and enforcing compliance guidelines influence how health professionals comply with safety guidelines. The conceptual framework for this study is presented below.



1.7 Organization of the Thesis

The report of this research was divided into five sections: the problem statement, goal of the study, objectives of the study, research questions, importance of the study, constraints and delimitations of the research, basic assumptions of the study, and study organization are all covered in Chapter One. The study's second chapter is a review of literature that includes thorough studies from selected literature. The study methodology was detailed in the third chapter. In Chapter Four, the findings of the study were presented and discussed in the context of current literature. In the final chapter, a summary of the study was be provided, along with conclusions drawn and associated recommendations.

CHAPTER TWO

2.0 LITERATURE REVIEW

2.1 Overview of Occupational Health and Safety

The major purpose of occupational health, according to a collaborative panel of the World Health Organization and the International Labor Organization (ILO), is to promote and maintain the highest degree of physical, emotional, and social well-being among employees in all professions. To achieve this goal, all employees should have access to a secure and stable working atmosphere as well as Support for occupational health (Forastieri, 2001).

WHO has described occupational health as a multi sectorial approach aimed at protecting and promoting workers' health by removing work-related causes and conditions that are dangerous to their health and safety; it involves improvement of workers' psychosocial, and physical health, and assistance with the growth and preservation of their working ability, as well as technical and social development at work and growth of long-term work conditions (WHO 1995).

The Occupational Health and Safety Administration Act (1970) of the United States Department of Labour reiterated this aim by stating that the goal of occupational health and safety is to provide for study, knowledge, education, and training in the field of occupational safety and health, to authorize compliance of the standards established under the Act, to assist and encourage states in their efforts to provide for safe and healthy working conditions, and for other purposes. It is also standard requirements, or the implementation or use of one or more procedures, means, approaches, activities, or processes that are reasonably required or sufficient to provide safe or healthy jobs and places of employment is considered to as a safety and health standard in the workplace (Goldstein, 1971). According to the European Union Agency for Occupational Health

and Safety at Work (EU-OSHA), occupational health and safety need to be seen as an important corporate goal, just as efficiency, customer satisfaction, productivity, development, and profitability are. Occupational health and safety can be implemented more effectively if it is incorporated into a quality control system. Risk evaluation is a continuous process that must be replicated regularly, and the findings must be reported and incorporated into management's strategic planning (EU-OSHA, 2011).

2.2 Occupational Health and Safety Hazards

Hazards are workplace characteristics, they can be psychosocial or physical, or a blend of the two that have the potential to cause damage or unintended consequences (Gosselin *et al.*, 2020). Chemicals, a slick floor, working while standing, or working while on your feet or on a scaffold are examples of intrinsic characteristics of a material, source of energy, or circumstance that have the capacity to have profound impacts. (Ghana Ministry of Health-MOH, 2010).

As healthcare employees work in a variety of settings around the hospital, performing a wide range of tasks, they are usually exposed to variety of dangers. The most common forms of workplace dangers reported in the literatures on occupational safety and health ranges from biological, physical, chemical, and ergonomical to psychological. Blood and other fluids from the body, fungi/mold, bacteria and viruses, insect stings, and animal and bird excretions are all biological risks. (Ndejjo et al., 2015; Sacadura-Leite et al., 2018). Physical dangers include ionizing and nonionizing radiation (EMFs, microwaves, radio waves, etc.), high sunlight/ultraviolet ray, exposure to extremes of temperature, inadequate lighting, poor ventilation, defective electrical wiring, and bare electrical cables (El-Sallamy et al., 2018). Chemical hazards include: liquids such as cleaning products, paints, acids, and solvents (particularly if the chemicals are in an unlabelled

bottle), vapors and fumes from welding or solvent exposure, gases such as acetylene, propane, carbon monoxide, and helium, flammable materials, such as gasoline, solvents, and explosive chemicals, and pesticides (Rosenstock et al., 2006). Ergonomic hazards entails poorly adjusted chairs and workstation, recurrent lifting of heavy goods, inappropriate posture, uncomfortable movements, particularly if recurrent, repeating the same movements over and over, having to use a lot of energy, especially if it is required frequently, and vibration (Che Huei et al., 2020).

Examples of psychological hazards include work-related stress and workplace abuse (OSHA, 2020).

2.3 Precautions for Occupational Safety

Organizational precautions, technical protective measures, and the usage of protective gears are the three types of precautions and safety measures. Organizational measures include well-planned locations for machinery/fittings, proper equipment and material selection, safety training and work instructions, excellent ergonomic organization, skills requirements, and access restrictions to hazardous tasks. Noise screening, fume closets, safety cabinets, hood extraction, emergency showers, and eye baths are examples of technical protective measures. (https://www.uib.no/en/hms-portalen/80058/precautions-and-safety-measures#personal-protective-equipment-ppe-)

PPE refers to all equipment, including accessories that personnel use while working to protect themselves from dangers and hazards that might endanger their health and safety. Gloves, eye/face protection, hearing protection, coats/aprons, and foot wears are examples of PPE. (*https://www.uib.no/en/hms-portalen/80058/precautions-and-safety-measures#technicalprotective-measures* .Access on 15th May 2021)

According to the policy guideline of the Ministry of Health, Ghana on occupational health and safety in the health sector, preventive activities are taken in a variety of ways, all of which work together to improve health and safety (*Occupational Health and Safety Policy and Guidelines*, 2010). The Occupational Safety and Health Administration (OSHA) of Centre for Disease Control (CDC) recommended seven key components of safety practices. These have been explained in Table 1 below.

Table 1: Key Elements of Health and Safety Programme and Recommended Practices

MANAGEMENT	• Senior executives proves its dedication to continual safety and health improvement, conveys that dedication to employees, and establishes goals and responsibilities. • Leaders at all levels make safety and health a key company priority, setting goals and objectives for safety and health.
EMPLOYEE INVOLVEMENT	• All components of the programme are involving workers and their representatives, including creating goals, detecting and reporting hazards, examining events, and measuring performance.

	• All employees, particularly consultants and temporary employees, are aware of their duties and obligations under the programme, as well as what they must do to perform them out appropriately. • Employees are expected to communicate honestly with leadership and raise safety and health problems without fear of punishment, and they have the tools to do so.
IDENTIFYING HAZARDS AND	• Each impediment or difficulties to employee empowerment in the project are eliminated or addressed (for example, language, an insufficient information, or punitive measures).

ASSESSMENT	• Measures are in place to identify and evaluate workplace hazards and risks on a regular basis. • Hazards to safety and health are discovered and analysed in routine, nonroutine, and urgent circumstances. • Periodic inspections and reassessments are used to identify new risks after an initial assessment of existing hazards, exposures, and management measures. • Every occurrence is researched in order to determine the underlying reasons.
HAZARD PREVENTION AND CONTROL	• Proper control of hazards identified is prioritised. • Management and workers work together to discover and choose strategies for removing, avoiding, or regulating dangers in the workplace. • Controls are chosen using a structure that prioritizes engineering solutions, work practices, administrative controls, and personal protective equipment (PPE).

	• Controls are implemented, intermediate protection is provided, work is documented, and the efficacy of measures is tested according to a plan.
EDUCATION AND TRAINING	• All employees are trained to comprehend how the system operates and how to perform the tasks that have been allocated to them.
	• Companies, executives, and directors are educated on safety issues as well as their obligations for safeguarding employees' rights and reacting to complaints and concerns.
	• All employees should be trained on how to spot workplace hazards and how to use the precautions that have been put in place.
EVALUATION AND IMPROVEMENT	• The effectiveness of control measures is assessed on a regular basis.
	• Measures are implemented to track program outcomes, ensure that it is properly implemented, and discover programme flaws and areas improve for enhancement.
	• To the program's total safety and health performance, necessary activities are implemented.

COMMUNICATION BETWEEN EMPLOYERS AND RECRUITMENT AGENCIES	• Host companies, consultants, and job agencies agree to provide all employees with the same degree of safety and health protection. • Host organizations, consultants, and recruitment agencies convey the hazards that exist on the jobsite as well as the hazards that contract workers' work may generate. • Consultants and employment agencies must meet the standards and qualifications set forth by host businesses. • Prior to starting work, companies, suppliers, and staffing companies collaborate on work scheduling to identify and resolve any potential safety or health concerns.

Source: (Occupational Health and Safety Administration (OSHA), 2001)

2.4 Studies Evaluating Healthcare Workers' Knowledge of, and Compliance with, Standard Precautions and Barriers to Compliance with Standard Precautions

Several studies has been conducted to improve insights on HCWs' knowledge of, and compliance with, standard precautions and barriers to their compliance with standard precautions.

As an example, Sadoh *et al*. (2006) evaluated adherence to SPs by 433 HCWs in Nigeria's

Abeokuta city, the capital of Ogun State. Doctors, professional and assistant nurses, laboratory professionals, and support workers were among those who took part in the survey. These interviewees were drawn from public and private healthcare facilities throughout the city using a multistage sampling process. An interviewer-administered, semi-structured questionnaire was used in assessing the practice of recapping and disposal of used needles, use of barrier equipment, handwashing, and screening of transfused blood. The researchers revealed that about a third of all respondents always recapped used needles. Compliance with non-recapping of used needles was found to be highest among trained nurses and worst with doctors. Less than two-thirds of the respondents (63.8%) were reported to always use personal protective equipment, and more than half of all respondents (56.5%) had never worn goggles during deliveries and at surgeries. It was also reported that the provision of sharps containers and screening of transfused blood by the institutions studied was uniformly high. A high percentage (94.6%) of HCWs observed handwashing after handling patients. The use of barrier equipment was, however, variable in the institutions studied. The researchers thus recommended that training programmes and other relevant measures be put in place to promote the appropriate use of protective barrier equipment by HCWs at all times (Sadoh et al., 2006).

In another study, Bahcecik & Ozturk (2009) evaluated occupational health concerns and occupational safety precautions and applications of a private hospital and a university hospital in Turkey; the view of nurses. A descriptive study was conducted, total of 162 nurses from the teaching hospitals and 150 from the private owned facilities volunteered to participate in the study despite not using any sampling method. They employed the use of questionnaire that included 7 socio-demographic questions about nurses (including age, marital status, educational levels, years of expertise, years of facility and ward experience, and hospital positions) and 17 basic questions

on occupational safety and health in facilities. The study provided little information on data analysis. In their findings, 58% of the nurses at the university hospital said they took safeguards for medical and hazardous wastes, 56% for infection monitoring, 56% for staff immunizations, and having security personnel was 54%. A greater proportion (93%) of the nurses in the private hospital reported that steps were made to monitor the infection rate as well as the following safeguards: Employee immunization 89%; fire and other natural disaster rules 88%; documented rules for ensuring safety 84%; 85% stated their heating and cooling systems are adequate, while nearly two - thirds claimed they do not utilize damaged or substandard equipment. For the management of medical and hazardous waste (81%). According to 81% of the respondents, accidents are followed up on and records are kept; Control and maintenance of equipment, as well as the usage of tools, are noted by 81 %. 79% of those surveyed said they are protected from blood and other fluids (Bahcecik & Ozturk, 2009).

Furthermore, Foster *et al*. (2010) evaluated knowledge, compliance with, and practice of, SPs among HCWs at two healthcare institutions in Jamaica. Cross-sectional study design was employed by the researchers. Physicians and nurses were evaluated with the aid of a structured questionnaire made of 14 items. Breast milk (79 %), sputum (14 %), urine (27 %), fluids from the lung (53 %), Cerebral spinal fluid (55 %), synovial fluid (37 percent), faecal matter (27 %), fluids from the abdomen (53 %), and vomitus representing 21% were all associated with elevated risk for acquiring Human immunodeficiency virus by the participants, according to the researchers . They also estimated the risk of transmission of infection after a needle stick injury from patients with HIV Aids infection, Hepatitis B infection, and Hepatitis C infection to be 22.5%, 34%, and 26%, respectively. In addition, 63 % of the respondents said that needles used to draw blood pose the greatest danger of spreading infection. Donning of gloves (38 %), not re-capping needles (22

%), avoiding giving needles directly to colleagues (70 %), safely discarding of needles (86 %), and handling patients' bodily fluid as possibly infectious (62%) were also reported as always being complied to according to the study. Following post exposure with needles, 43 % of the respondents stated that the first aid method should be squeezing the site of injury to bleed, followed by cleaning with soap under running water (29 %), and flushing the region using water (20%). The researchers concluded that, despite being conscious of the potential dangers of infectious disease, healthcare professionals' complying with Safety precaution were unsatisfactory. They emphasized the importance of improving knowledge and performance by providing clear standards through a detailed plan designed to educate Staff about SP compliance. (Foster *et al*. 2010)

Similarly, in a non-experimental descriptive study done by Okhiai *et al*. (2014) theatre staff of Irrua Specialist Teaching Hospital (ISTH), Edo State, Nigeria to assess their knowledge, attitude and practice of standard precautions. Using a sample size of 170 respondents, comprising different categories of theatre personnel, a well-structured questionnaire was used to collect data on demographic characteristics, knowledge, attitude and practice of universal precaution among the health professionals. The data were analysed with descriptive statistics. The findings revealed that 80% of the participants are aware that standard precautions apply to all individuals/patients, regardless of their assumed health status. Standard precautions were viewed positively by 83.3% of respondents and viewed negatively by 6.6%. However, only 66.7% of this 83% use these SPs thoroughly, compared to 6.6% who do not use them at all or always. Moreover, the source of 66.7% of the participants' knowledge on standard precautions were seminars and the mass media (Okhiai et al., 2014).

Moreover, Chughtai *et al*. (2016) in a study evaluated factors influencing compliance with the use of medical and cloth masks amongst hospital HCWs in Vietnam. The HCWs' compliance was measured over a 4-week period in a randomized controlled trial where HCWs were instructed to

record their daily activities in diary cards. Demographic, clinical, and diary card data were used to determine the predictors of compliance and the relationship of compliance with infection outcomes. The researchers during the four week study, revealed that, both medical and cloth mask compliance rates fell: medical mask use fell from 77 to 68 percent (p 0.001), while cloth mask use fell from 78 to 69 % (p< 0.001). Adverse events (adjusted RR = 0.90; % CI = 0.85–0.95) as well as conducting aerosol-generating techniques (adjusted RR = 0.78; % CI = 0.73–0.82) were both inversely linked with compliance, whereas possible encounter with febrile and patients with respiratory symptoms such as cough was found to be strongly linked with compliance (Adjusted RR = 1.14; 95% CI = 1.07–1.20). Being compliant with medical or cloth masks use (average use ≥70% of working time) was not associated with clinical respiratory illness, influenza-like illness, and laboratory-confirmed viral infection (Chughtai et al., 2016).

El Hassouni *et al*. (2021), through a cross-sectional study conducted at a medicine department of Hassan II University Hospital in Fez, Morocco, assessed knowledge and compliance with SPs among HCWs, in particular hand hygiene practice before and after care, and the use of personal protective equipment. The researchers employed direct observations and anonymous questionnaire. They reported that hand hygiene was practiced at a frequency of 23.3% before care, and at 45% after care. In 38.3% of the cases, the prerequisites of good hand hygiene were not respected. Glove use was respected at 96.6%, and mask was used at 77.1%. The researchers suggested that training and education programs needed to be conducted to improve knowledge and compliance with hand hygiene (El Hassouni et al., 2021).

In Ghana, Akagbo *et al*. (2017) assessed the knowledge of standard precautions, compliance with, and challenges to compliance with Standard Precautions among healthcare workers in two public hospitals in the Eastern Region's Lower Manya Krobo Area. Descriptive statistics was employed to summarizing data on socio-demographic characteristics of the respondents', knowledge of SP and compliance and barriers to SP in frequencies and percentages. Only 37.0 % of healthcare workers knew that Standard precautions involves hand washing before and after every patient contact, 39.0 % had knowledge about covering the mouth whilst coughing or sneezing, and 40.0 % had knowledge about sterile technique, which involve infection control practices to reduce the risk of contamination. According to the researchers, 50 % of the participants constantly shielded themselves from patients' blood and other body fluids; around a quarter of the participants did not cover needles after using it, and 28.0 % did not always wipe blood spills immediately. Putting on personal protective equipment's such as gloves, masks, gowns, and goggles, according to healthcare workers, can occasionally cause patients to fear (63.0%), and adhering to standard precautions can sometimes make it difficult to administer treatment (38.0 %). Healthcare workers did not always have ample time to comply with the constraints of SP (44.0 %), and PPEs were not always present due to the demands of patient care (Akagbo, Nortey, & Ackumey, 2017).

Similarly, research done in 2006 at the Korle Bu Teaching Hospital among fifty medical doctors, ranging from trainee doctors to consultants, revealed a disparity in knowledge of standard precautions and practicing them (Hesse *et al*., 2006). Another study of 422 Accra-based healthcare employees indicated that those with sufficient knowledge of safety and health regulations are more inclined to adhere to standard precaution. (Amponsah-Tawiah & Adu, 2016). Another study of 108 nurses in Ghana's Tamale Metropolis revealed that, most nurses (94.4 %) believed they are

susceptible to hepatitis B infection, but just a few had sufficient understanding about hepatitis B post-exposure prophylactic treatment. (Konlan *et al*., 2017).

Regarding factors influencing HCWs' compliance with SPs, several factors have been identified. A number of these can be discerned from the findings of the study of Gershon et al., (1995). For example, female HCWs had a higher overall compliance than male HCWs. Nurses had the highest compliance, while physicians had the lowest. Employees with higher degrees had lower compliance rates than those with less than 16 years of schooling. Members of staff who work more than 50 hours a week had lower compliance than those who worked less than 50 hours each week. While the majority of employees were highly knowledgeable about SPs, it did not reflect in their adherence. Staff with low levels of job stress have higher levels of compliance than those with higher levels of work-related stress. (Gershon et al., 1995).

Similarly, Chalya et al. (2016), in their study, reported a statistically significant relationship between SP awareness and gender, job category, professional experience, and past training on SPs. Professional experience of at least 5 years was linked to good SP practice. Awareness and compliance (practice) with universal precautions were highly associated. Lack of personal protective equipment (69.5%), lack of awareness (65.0%), emergency circumstances (63.0%), assumption that the client is not contaminated with HIV or HBV (59.0%), limited time (53.0%), work stress (48.0%), and the lack of sanctions were all factors linked to inadequate compliance with SPs (34.0%). (Chalya et al. 2016),

CHAPTER THREE

3.0 METHODOLOGY

3.1 Introduction

This chapter discusses how the research was conducted. It includes the research design employed, indicates the target population used for the study, the sampling procedure and size, research instruments, data collection procedure, data analysis techniques employed, and ethical issues taken into consideration.

3.2 Study Design

The study employed cross-sectional design and quantitative research approach (descriptive) was used to gather information on factors influencing compliance to occupational health and safety guidelines, level of knowledge of healthcare workers regarding occupational health and safety guidelines and then awareness and practice of safety guidelines. This study design was chosen for the study because it allows for a clear unraveling of the research questions and justifies its choice. It also evaluates and harmonizes prior literature in relation to the investigation. connected to the study's issue. It is less expensive than other designs (Creswell & Creswell, 2018). Similarly, the essence of this study design is that it enables researchers to relate, link or compare several dissimilar or similar variables at the concurrently or simultaneously although the design is unable to establish a cause-and-effect relationship due the fact that the design when used offers a snapshot of a single moment in time but do not consider event before or after the snapshot is taken (Institute for Work & Health, 2015).

3.3 Study Area

The study was conducted at the Korle Bu Teaching Hospital (KBTH) in the Greater Accra Region. It is the premier tertiary healthcare facility in Ghana, established on October 9, 1923. It serves as a site for training student doctors of the School of Medicine and Dentistry, University of Ghana. With 2,000 beds, 21 clinical diagnostic departments, and 3 Centers of Excellence, it is Africa's third largest referral facility. It has a 1,500-person typical outpatient population and roughly 250 inpatient hospitalizations. Internal Medicine and Therapeutics, Child Health, Surgery, Obstetrics and Gynaecology, Anaesthesia, Family Medicine/Polyclinic, Accident and Emergency, Psychiatry, Reconstructive Plastic Surgery and Burns Centre, and Accident & Orthopaedics are among the clinical and diagnostic departments. Pharmacy, Pathology, Laboratory, and Radiology are some of the others. Neurosurgery, Paediatric surgery, Dental/Oral maxillofacial surgery,

Ophthalmology, Ear, Nose & Throat (ENT), Renal, Orthopaedics, Oncology, Dermatology, Reconstructive Plastic Surgery, Cardiothoracic Surgery, and Radiotherapy & Nuclear Medicine are among the specialized fields available at the hospital.

3.4 Study population

Healthcare workers, including nursing personnel (nurses, midwives, and healthcare assistants), medical staff (doctors and physician assistants), laboratory employees (biomedical scientists and laboratory technicians), pharmacy employees (pharmacists and dispensary technicians), radiologists, physiotherapists, orderlies, and mortuary personnel served as the targeted population for the study.

3.5 Inclusion Criteria

1. All healthcare personnel who consented to participation were considered eligible for inclusion in the study.

2.

3.6 Exclusion Criteria

All healthcare personnel of the hospital who declined to participate, were critically ill, or mentally unstable at the time of conduction of the study were excluded.

3.7 Sample Size Determination

In total, 346 healthcare personnel were recruited for the study. The minimum sample size was determined using Yamane's formula of population sampling (Yamane, 1967), as follows:

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

Where *n* is the minimum sample size, *N* is the total population, and *e* is the level of sampling error (5%) to determine the sample size for the study. A non-response rate of 10% was added to the sample size, therefore sample size was 381 health workers.

$$\mathrm{n} = \frac{3178}{1+3178\,(0.05)^2} = 346$$

Table 2: Proportional Distribution

Category of Health Workers	**Number**	**Proportion**	**Sample size**
Doctors	523	17%*346	59
Nurses/Midwifes	2175	68%*346	235
Pharmacist	139	4%*346	14
Biomedical Scientist	125	4%*346	14
Others	216	7%*346	24
TOTAL	**3178**		**346**

3.8 Sampling Method

A sampling frame from the hospital records comprising medical doctors (523), nursing staff (2175), pharmacy staff (139), biomedical scientists (125), and others (216) were collected. A probability sampling technique thus simple random sampling technique was used after generating a random list in Microsoft Excel 2019 when the staff list was collected.

After obtaining informed consent, a standard interviewer-administered questionnaire (Appendix II) was used to collect data on the participants' sociodemographic features, and data on knowledge and compliance with standard precautions.

The questionnaire was validated to determine the Cronbach's Alpha, which measures the internal consistency.

3.9 Study variables

The variables used in the study were categorized dependent and independent variables

3.9.1 Dependent Variable

Section C: Compliance to safety precautions

3.9.2 Independent Variable

Section A; Sociodemographic Characteristics: Age, Gender, category of staff, income, years of experience etc.

Section B-Part 1; Respondents Knowledge of safety guidelines

Section B-Part 2; Awareness and Practice of safety guidelines

3.11 Ethical Consideration

The study was conducted in line with guidelines of the Declaration of Helsinki. Ethical approval was obtained from the Institutional Review Board of the Korle Bu Teaching Hospital (KBTH). In addition, informed consent (Appendix I) was obtained from each participant prior to the administration of the questionnaire. The privacy of the participants was respected, and data collected from them is stored on a password-protected computer.

3.12 Data Analysis

The Statistical Package for Social Sciences (SPSS V26.0) was used to analyze the data making use of descriptive and inferential statistics.

The data was presented as means and standard deviations for continuous variables that were symmetrically distributed "but as median and interquartile ranges for skewed continuous variables. The questionnaire was mostly closed questions, and the other parts had a three Likert scale questionnaire. The Cronbach's alpha was 0.76 - indicating good internal validity. The Likert scale questionnaire was used to assess rate of compliance to standard safety precautions. The Likert choices chosen by the respondent was summed and mean values were calculated and used for further analysis.

The below presents how each objective was analyzed

3.12.1 To evaluate the knowledge of healthcare workers at the Korle-Bu Teaching Hospital regarding occupational health and safety guidelines.

Questions pertaining to assessing their knowledge were scored against the correct answers for each question. All correct answers were therefore summed and graded according to the grading below;

"0-2marks – Poor Knowledge", "4-5marks – Average Knowledge", and "6-8 marks" – Good Knowledge. Knowledge scores were then used in the logistic regression as an independent variable.

3.12.2 To determine the healthcare workers' compliance with standard precautions.

The data analysis technique used to determine health worker's compliance with standard precautions was also scoring all questions (correct =1, wrong=0) which had answers to be correct. The correct answers were summed for each respondent and derived another continuous variable.

3.12.3 To determine factors influencing the healthcare workers' compliance with standard precautions.

Factors influencing compliance with standard precautions were analyzed using a multiple linear regression. The independent variables were knowledge scores (continuous), factors affecting compliance (continuous), awareness scores (continuous) and practice scores (continuous) whereas the dependent variables used was level of compliance. Data on knowledge and compliance level of respondents was generated in percentages using a close ended questionnaire. A multiple linear regression was run to fit a model to explain and predict how independent variables affect the outcome variable.

CHAPTER FOUR

4.0 ANALYSIS AND RESULTS

4.1 Introduction

This chapter contains a detailed presentation and discussion of data analysis and results of the data captured on the field. This analysis was done in alignment with the research questions and objectives of the study.

4.2 Demographic characteristics of respondents

Three hundred and thirty-nine (339) respondents participated in the study. The table below (Table 4.1) presents the summary of the demographic characteristics of the respondents. The proportion of female respondents was 63.2% while the remaining 36.8 % were males. The mean age as well as the standard deviation (SD) of respondents was 31.6 (±5.7) years, whereas the minimum age and maximum age of the respondents were 21 years and 55 years respectively. Respondents of all ages (21 through to 60) were represented. While the majority of the respondents (93.5%) were between 21- 40 age brackets, only a few (constituting 6.5 %) were above 40years of the total respondents. The findings of this study showed that the majority of the respondents (59.0%) were not married (Table 4.1)

On the educational levels of respondents, a greater proportion of the respondents (90.6%) were diploma/certificate and degree holders with only a few holding Post Graduate degrees. In general, the majority of the respondents (79.9%) had between 3 years to 6 years of working experience as compared with 21.1 % having worked for more than 7 years.

Table 4.1: Demographic Characteristics of Respondents

		Frequency	Percent (%)	Cum. Percent (%)
Mean Age (SD)		31.6 (±5.7) years		
Age grp	21-30 yrs.	169	54.9	54.9
	31-40yrs	119	38.6	93.5
	41-50yrs	17	5.5	99.0
	51 above	3	1.0	100.0
	Total	308	100.0	
Gender	Male	124	36.8	36.8
	Female	213	63.2	100.0
	Total	337	100.0	
Marital Status				
	Married	139	41.0	41.0
	Single	200	59.0	100.0
	Total	339	100.0	
Education	Degree	194	57.2	57.2
	Diploma/ Cert	113	33.3	90.6
	Post Grad	32	9.4	100.0
	Total	339	100.0	
Experience	10 Years and above	28	8.3	8.3
	Between 3 and 6	127	37.5	45.7
	Between 7 to 9	41	12.1	57.8
	Less than 3 years	143	42.2	100.0
	Total	339	100.0	

The findings further indicated that Nurses/ Midwives formed a greater (69.0%) part of the respondents, whereas doctors were only 16% (figure 4.1). A majority of the respondents were from the Accident and emergency department (22%), followed by Paediatric department and surgical department 16.0% (Figure 4.2).

Figure 4.1: Categorization of respondents in the hospital according to profession

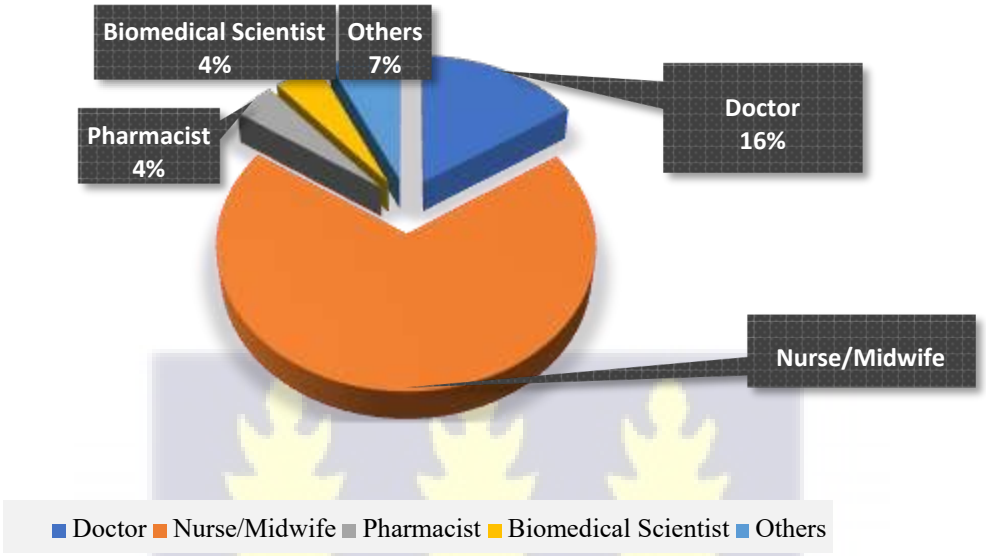
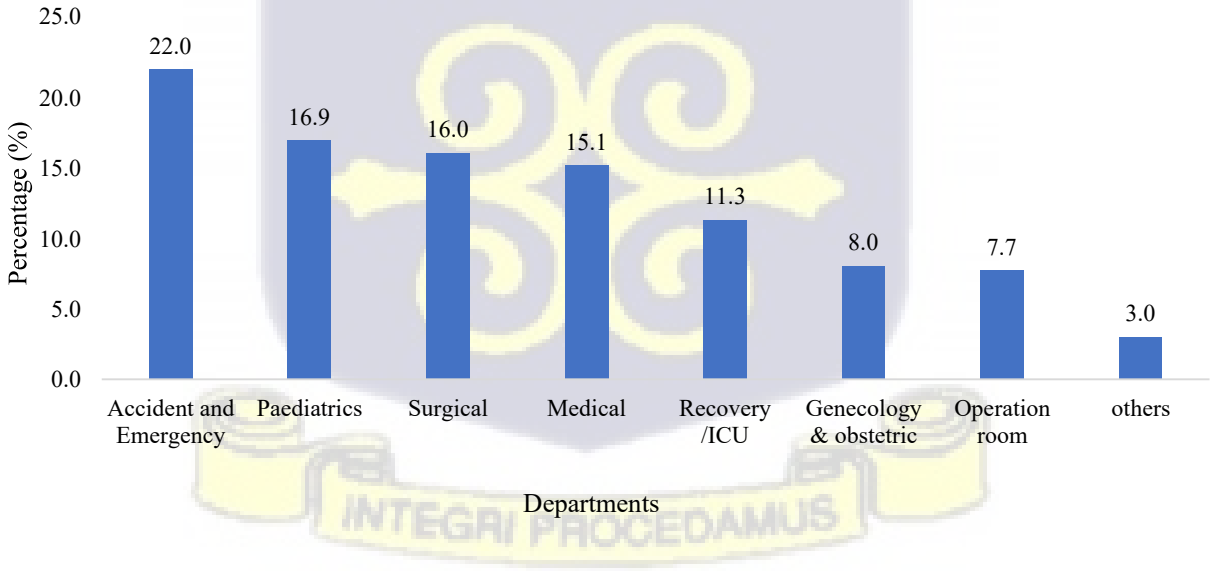


Figure 4.2: Departments staff respondents belong to



4.3 Respondents knowledge on workplace hazards and safety precautions.

Findings revealed that almost all respondents (99.7%) had knowledge about workplace occupational hazards and safety precautions. Correspondingly, 88.4% of respondents regarded "malaria as not an occupational infection in the hospital. Majority (64.6%) of respondents also indicated "faeces and urine" as the most likely source of occupational hazard. The results are summarized in Table 4.2. below.

Table 4.2: Respondents knowledge on workplace hazards and safety precautions

Question	Options	Frequency	Percent (%)
Do you know about occupational hazards	Yes	338	99.7
	No	1	0.3
	Total	339	100.0
Which one of the following is NOT an occupational hazard in this hospital	Noise	17	5.1
	Needle stick injuries	24	7.2
	Early arrival at work	291	86.9
	Body contamination with patients' body fluids	3	0.9
	Total	335	100.0
Which one of the following is NOT an occupational infection in this hospital	HBV	7	2.1
	HIV	6	1.8
	Chicken pox	26	7.8
	Malaria	296	88.4
	Total	335	100.0
The MOST likely source of occupational infections is one of the following	air-borne	83	22.5
	faeces and urine	12	3.5
	blood and body fluids	219	64.6
	body contact	25	7.4
	Total	339	100.0

A high proportion of respondents (86.1%) in the study reported that needle stick injury was likely to occur during recapping. Similarly, majority of the respondents (98.5%) indicated that handwashing was a good SP to prevent occupational cross infection after procedures.

Table 4.3: Respondents knowledge on workplace hazards and safety precautions continuation

Question	Options	Freq.	Percent (%)
During which of the following activities are a needle stick injury MOST likely to occur?	Recapping	292	86.1
	transporting to the sharp's disposal safety box handling equipment before use	25	7.4
		10	2.9
	handling equipment after disposal	12	3.5
	Total	339	100.0
Which of the following violates the Standard Precautions	Aspirating for blood before intramuscular injections	36	10.6
	Recapping needles after use	178	52.5
	leaving needles attached to syringes after use	125	36.9
	Total	339	100.0
Hand washing is good to prevent occupational cross infection after procedures	Yes	334	98.5
	No	1	0.3
	Don't know	4	1.2
	Total	339	100.0

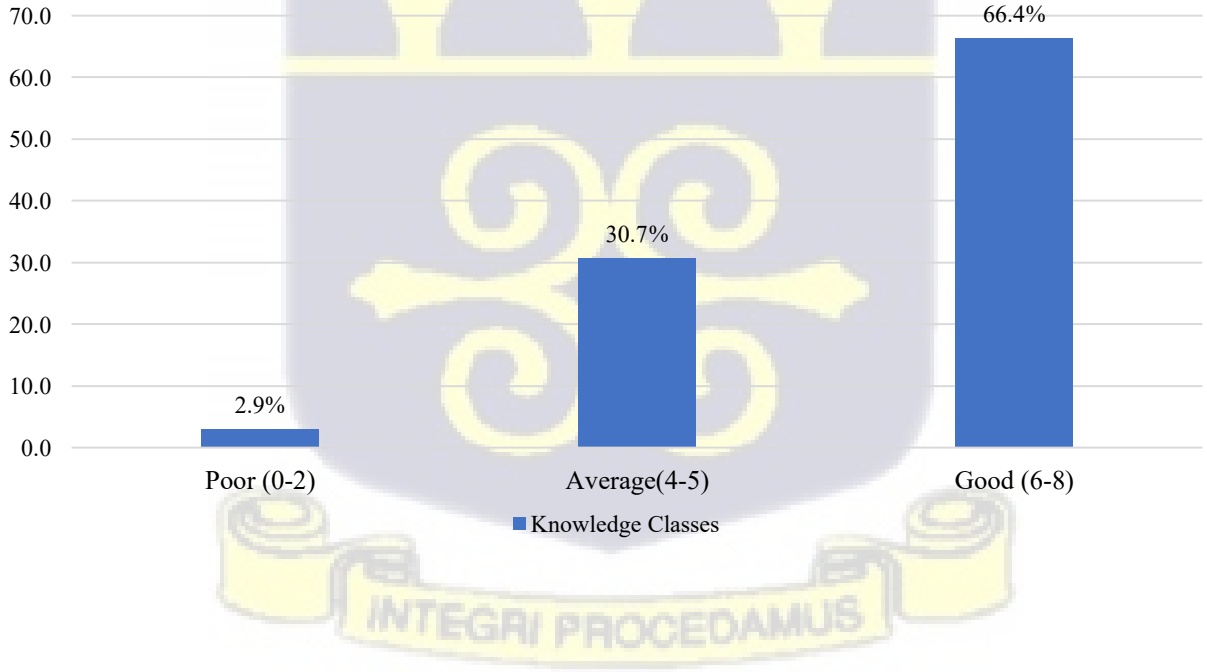
4.4 Respondent's knowledge scores on Workplace Hazards and Safety Precaution (WHSP)

According to the data, majority of respondents (66.4 %) had a high or good knowledge of workplace hazards and safety practices, scoring 6 marks or above. Only 3.0% had poor knowledge (2-3 marks) while 30.7 % had average knowledge (4-5marks).

Table 4.4 Respondent's knowledge scores results on workplace hazards and safety precaution

	Frequency	Percent (%)	Cum. Percent (%)
2 marks	5	1.5	1.5
3 marks	5	1.5	3.0
4 marks	28	8.6	11.6
5 marks	67	20.6	32.2
6 marks	113	34.7	66.9
7 marks	93	28.5	95.4
8 marks	15	4.6	100.0
Total	326	100.0	

Figure 4.3: Classification of knowledge scores of workplace hazards and safety precaution



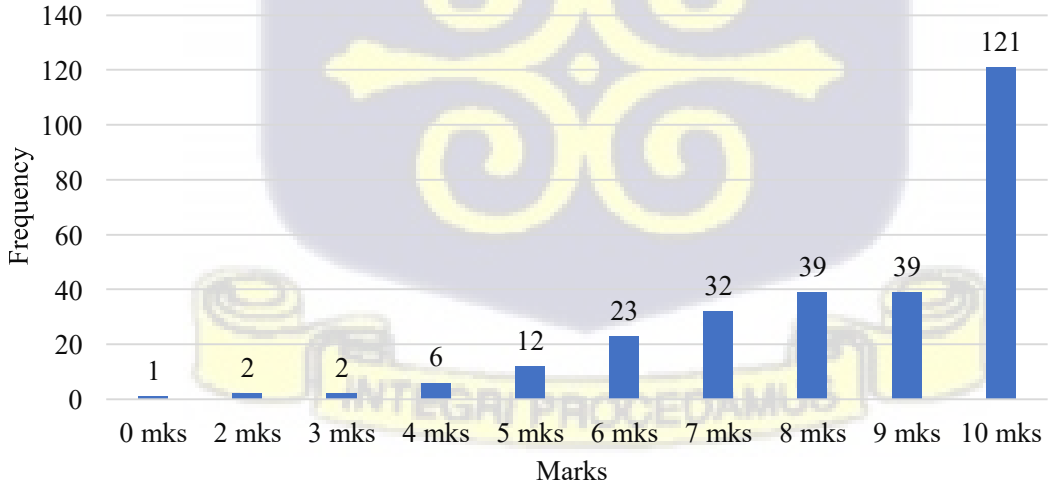
4.5 Respondent's awareness and practice scores of Workplace Hazards and Safety Precautions

Summary of results in Tables 4.5 and 4.6 presents respondents' awareness or non-awareness of WHSP and whether or not respondents practice WHSP. Findings revealed that majority (97.8%) of the respondents were fully aware of certain precautions scoring "8" and more marks (table 4.5) but when it came to practicing or observing these precautionary measures only 43.7% "always" practice them (Table 4.6).

Table 4.5: Respondent's awareness scores of Workplace Hazards and Safety Precaution (WHSP)

Marks	Frequency	Percent (%)	Cum. Percent (%)
0 marks	1	0.3	0.3
2 marks	2	0.6	1.0
3 marks	1	0.3	1.3
6 marks	1	0.3	1.6
7 marks	2	0.6	2.2
8 marks	4	1.3	3.5
9 marks	23	7.3	10.8
10marks	281	89.2	100.0
Total	315	100.0	

Figure 4.4: Respondent's practice scores of Workplace Hazards and Safety Precaution (WHSP)



4.6 Respondent's compliance with Workplace Hazard and Safety Precautions

Tables 4.7 and 4.8 below summarizes the results of respondent's compliance to workplace hazards and safety precautions. Results obtained from the study showed that there was a commendable high compliance of 92.9% and 98.0% to "washing of hands before clean or aseptic procedures" and "washing of hands after fluid exposure" respectively. The findings further revealed that "wearing of appropriate footwear" safety precaution was highly complied with (75.7%).

Table 4.6: Compliance with Workplace Hazard Standard safety precaution

Question	Options	Frequency	Percent (%)
Use appropriate body mechanics when handling patients	Don't comply	131	38.6
	Comply	206	60.8
	Total	337	100.0
Wash hands before clean or aseptic procedures	Don't comply	24	7.1%
	Comply	312	92.9%
	Total	336	100.0
Wash hands after body fluid exposure	Don't comply	6	2%
	Comply	329	98%
	Total	335	100.0
Wear appropriate footwear for work	Don't comply	81	24.3%
	Comply	253	75.7%
	Total	334	100.0
Wash hands immediately after removal of gloves	Don't comply	80	23.9%
	Comply	255	76.1%
	Total	335	100.0
Wash hands between patient contact	Don't comply	105	32.1%
	Comply	222	67.9%
	Total	327	100.0
Wash hands after touching patient surroundings	Don't comply	75	22.6%
I provide nursing care considering all patients as potentially infectious	Comply	257	77.4%
	Total	332	100.0
I protect myself against body fluids of all patients regardless of their diagnosis	Don't comply	42	12.6%
	Comply	292	87.4%
	Total	334	100.0

I wear clean gloves whenever there is a possibility of exposure to any body fluids	Don't comply	26	7.8%
	Comply	308	92.2%
	Total	334	100.0

There was an observed high compliance for changing of gloves between contacts with different patients (82.9%), sterilization of all reusable equipment before being used on another patient (85.3%), cleaning and disinfecting equipment and environmental surfaces (88.7%) and placing used sharps in puncture resistant container at point of use (90.6%). The results are indicated in Table 4.8.

Table 4.7: Compliance with Workplace Hazard Standard Safety Precaution continuation

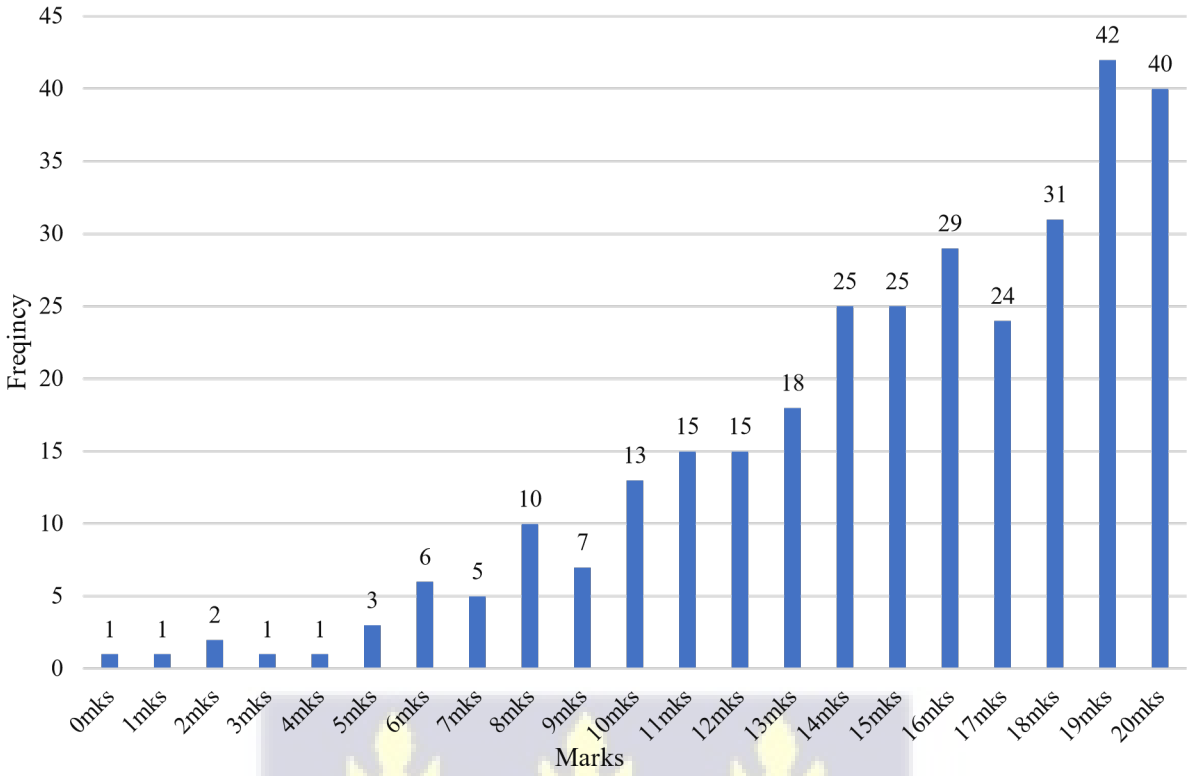
Question	Options	Frequency	Percent (%)
I change gloves between contacts with different patients	Don't comply	57	17.1%
	Comply	276	82.9%
	Total	333	100.0
I avoid wearing my gown out of hospital compounds	Don't comply	76	22.8%
	Comply	257	77.2%
	Total	333	100.0
I wear a waterproof apron whenever there is a possibility of body fluid splashing in my body	Don't comply	135	39.8
	Comply	199	58.7
	Total	334	100.0
I wear eye goggles whenever there is a possibility of body fluid splashing in my face	Don't comply	176	52.7%
	Comply	158	47.3%
	Total	334	100.0
I sterilize all reusable equipment before being used on another patient	Don't comply	49	14.7%
	Comply	285	85.3%
	Total	334	100.0
I clean and disinfect equipment and environmental surfaces	Don't comply	38	11.3%
	Comply	297	88.7%
	Total	335	100.0
I segregate non-infectious wastes in black colorcoded dust bin	Don't comply	107	32.0%
	Comply	227	68.0%
	Total	334	100.0
I segregate infectious medical wastes in yellow coloured coded dust bin	Don't comply	108	32.3%
	Comply	226	67.7%
	Total	334	100.0

I never bend needles with my hands	Don't comply	58	17.4%
	Comply	276	82.6%
	Total	334	100.0
Reporting Injuries in incidence book	Don't comply	107	47.3%
	Comply	226	67.9%
	Total	333	100.0
I place used sharps in puncture resistant container at point of use	Don't comply	31	9.4%
	Comply	299	90.6%
	Total	330	100.0
I never recap needles	Don't comply	169	51.1%
	Comply	162	48.9%
	Total	331	100.0

4.7 Rate of Compliance with Workplace Hazard Standard Safety Precaution by Respondents

Figure 4.5 below presents the rate of compliance to standard safety precautions by the respondents. Their compliance to standard safety precautions were scored and presented below. Generally, there was a high rate (75%) of compliance represented in marks by a median of 16.0 marks (total compliance marks = 20 marks). Relatively, 11.8% of the respondents had less than 10 marks of compliance. Finally, 12.7% of the respondents had 100% compliance with safety precautions (20/20 marks).

Figure 4.5: Level (Extent) of Compliance with Workplace Hazard and Safety Precaution



4.8 Factors affecting respondent's compliance to Workplace Hazard and Safety Precaution

Results obtained from the study indicates that factors such as management support for safety, accessibility and availability of PPEs and other safety equipment, feedback for safety practice, receiving training on safety precautions, and workplace safety climate influences the compliance levels of respondents to safety precautions. Summary from Table 4.10 shows that non-availability and accessibility of PPE, and non-availability of other safety equipment were the major compliance inhibiting factor. The majority of the respondents (69.2%) states that they have "received training on safety measures."

Table 4.8: Factors Associated with Compliance

Question	Options	Frequency	Percent (%)
Availability of PPEs and other Safety equipment	Not readily available	208	63.0
	Readily available	122	37.0
	Total	330	100.0
Accessibility of PPEs and other Safety equipment	Not readily available	215	65.3
	Readily available	114	34.7
	Total	329	100.0
Management support for safety	less frequent	222	67.1
	More frequent	109	32.9
	Total	331	100.0
Feedback for safety practice	Not readily available	239	72.2
	Readily available	92	27.8
	Total	331	100.0
Work place safety climate	Not readily available	190	57.4
	Readily available	141	42.6
	Total	331	100.0
Received Training on Safety	No	102	30.8
	Yes	229	69.2
	Total	331	100.0

4.9 Multiple Linear Regression analysis to predict the rate of compliance to Workplace Hazard Standard Safety Precaution

Table 4.11 below presents a multiple linear regression with a dependent variable "rate of compliance to standard safety precaution" (continuous variable). The linear multiple regression

was run to predict respondent's rate of compliance from "WHSP knowledge scores", "WHSP awareness scores", "WHSP practice scores" and "factors that affect compliance score". The overall regression model was statistically significant in predicting compliance, F (4, 248) = 19.68, p < .0005, R^2 = 0.24(see appendix). "Factors affecting compliance score" and "practice scores" significantly (p<.05) predicted the "rate of compliance" of workplace occupational safety precautions. This implies that a unit increase of practice of standard scores safety precautions and enabling factors increases compliance rate by 0.66 marks and 0.59 marks respectively.

Table 4.9: Multiple Linear regression analysis to predict rate of compliance

Predictors	**Unstandardized Coefficients**		**Standardized Coeff.**	**Sig.**	**95.0% CL for B**	
	B	Std. Error	Beta		Lower Bound	Upper Bound
Factors	0.59	0.11	0.30	0.00*	0.36	0.81
Knowledge	0.09	0.19	0.02	0.66	-0.30	0.47
Awareness	-0.03	0.21	-0.01	0.87	-0.45	0.38
Practice	0.66	0.12	0.32	0.00*	0.42	0.89

Confidence Interval =CL, "*" = Significant, Significance= P-value

CHAPTER FIVE

DISCUSSION

5.0 Summary of findings

This chapter highlights findings that speaks to the objectives of the study. Majority of the respondents constituting 66.4% had high knowledge of workplace occupational hazards and safety guidelines in the facility. Further to their knowledge, 97.8% of the respondents were aware of workplace occupational hazards safety precautions while 43.7% always practiced these safety precautions. There was high rate compliance with standard safety precautions specifically in "washing of hands before clean or aseptic procedures" 92.9%, "washing hands after fluid exposure" 98.0%, "wearing of appropriate footwear" 75.7%, etc. Finally, in the multiple linear regression model, "factors such trainings, feedback for safety practice, availability and accessibility of PPEs and other safety equipment, management support , workplace safety climate scores" and "practice scores" significantly ($p<.05$) predicted the "rate of compliance" to workplace standard precautions among the respondents

5.1 Knowledge of Respondents on Standard safety precautions

In this study, 66.4% of the respondents had a high knowledge score in workplace occupational hazards and safety precautions. Knowledge is very essential and the possession of it enables one in making right choices. It is believed that a delay in seeking medical counsel or treatment is caused by ignorance or lack of knowledge of any health-related condition. This failure to submit or report for treatment has a number of severe consequences, including death. (Hahn & Truman, 2005).

Similar to these findings, a study done in the Police Hospital in Accra, Ghana found that participants recorded high and moderate levels of knowledge 93.5%, 84.0%, 82.0%, 72.0% and 65% of occupational hazards with biological, psychosocial, ergonomic, physical and chemical hazards segregations respectively (Duodu, 2018). Further to the trend of high knowledge, another study also found high knowledge (82%) of safety guidelines among health care professionals at Bugando Medical Centre ,Tanzania.(Chalya et al., 2016). Other research, on the other hand, found that only 37.0 % of respondents were knowledgeable of occupational hazards and safety precautions (Akagbo, Nortey, & Ackumey, 2017). Furthermore, a systematic review indicated that advanced countries had a higher degree of knowledge and awareness of occupational health hazards and safety measures than developing economies (Akagbo et al., 2017; Nyame-Annan, 2017).

The reasons for the high knowledge level found among the respondents of this study could be due to factors such as their attainment of the high status of education, specialized health professional workers, the study and use of sophisticated technological bio equipment. Another factor could be due to the study setting that is being a tertiary hospital where many training and teaching sessions go on.

5.2 Healthcare workers' compliance with safety precautions

There was extremely high compliance in this study for "changing of gloves between contacts with different patients" (82.9%), sterilization of all reusable equipment before being used on another patient (85.3%), cleaning and disinfecting equipment and environmental surfaces (88.7%) and placing used sharps in a puncture-resistant container at the point of use (90.6%). The rate of compliance to standard safety precautions in this study was moderately above average 60.8%. There were low compliances when this was compared to other studies, for instance, according to

a study, overall compliance with standard safety precautions by healthcare workers' was found to be very low, with a rate of compliance of only 12%, though there were certainly better compliance results with some specific standard safety precautionary measures like "washing hands after body fluid exposure," "washing hands immediately after removing gloves," and "wearing clean gloves whenever there is a possibility of exposure to body fluids." (Haile, Engeda, & Abdo, 2017). Further comparisons showed that there was low compliance found in other studies. According to the findings of another survey, only 18.2 % of healthcare professionals followed standard safety precautions such as "washing hands before touching a patient." "Offering nursing care while treating all patients as possibly infectious" accounted for 27.0 %. "Avoid wearing their hospital attire outside of the hospital compound" 37.6% of the population. "When there's a chance of body fluid splashing in their face, they wear goggles and/or masks." 21% of the population "putting noninfectious garbage in a black, color-coded dust container" 30.2 %, and 34.4 percent for "segregating infectious medical wastes in yellow color coded dust bin." (Alice, Akhere, Ikponwonsa, & Grace, 2013)

5.3 Factors affecting healthcare workers' compliance with standard safety precautions

The study utilized a multiple linear regression to find predictors of rate of compliance to standard safety compliance to workplace occupational hazards. The results obtained showed that "factors affecting compliance score" and "practice scores" significantly ($p<.05$) predicted "rate of compliance" of workplace occupational standard safety precautions. It implies that, a unit increase in practice of standard safety precaution score and enabling factors score increases compliance rate by 0.66 marks and 0.59 marks respectively.

The presence of factors such as PPEs and other Safety equipment, Work place safety environment and Work place safety climate significantly contribute to the compliance of occupational hazard precautions. A mere knowledge of safety precautions may not necessarily propel compliance among healthcare workers if there is absence of availability of these essential factors mentioned above. A study conducted in Nairobi, Kenya revealed and concluded that ,the key elements that affected compliance with occupational safety and health regulations among healthcare personnel were education and training. (Wambilianga & Waiganjo, 2013). Similarly, a study concluded that increasing awareness and training are essential factors that help reduce accidents and increase the likelihood of achieving compliance with safety precautions (Abaya, Diang'A, & Gwaya, 2021). Other factors that affect achieving compliance is the lack of management or stakeholders' support or involvement (Ondieki, 2016).

CHAPTER SIX

CONCLUSION AND RECOMMENDATION

6.1 Conclusion

From the above summary, it is clear that majority of the respondents constituting 66.4% had high knowledge of workplace occupational hazards and safety guidelines in the facility. Further to their knowledge, 97.8% of the respondents were aware of workplace occupational hazards safety precautions while 43.7% always practiced these safety precautions. There was high rate compliance with standard safety precautions specifically in “washing of hands before clean or aseptic procedures” 92.9%, “washing hands after fluid exposure” 98.0%, “wearing of appropriate footwear” 75.7%,. There was also moderately above average (60.8%) compliance to safety precautions. “factors affecting compliance such as management support, availability of PPEs, workplace safety climate, training” and “practice scores” significantly predicted “rate of compliance” to workplace safety precautions.

6.2 Recommendations

The following are recommendations for future planning and implementation:

- With 66% of the respondents knowledge of standard precaution, this number is woefully inadequate especially in a field whereby, the lives of people depends on the knowledge possessed by health workers. It is therefore recommended that there should be advocacy

by way of workshops and training sessions on safe work practices and guidelines to create more awareness and knowledge to avert injuries or adverse effects.

- Management of the health facility should make available related logistical support such as personal protective equipment, gloves, management support, ensure workplace safety climate to increase compliance to safety precautions.
- Also, management of hospitals should invest in necessary activities such as supervision, training, inspection, audits as well as motivation to staffs who comply to safety guidelines to enhance occupational safety and health compliance.
- The ministry of health and in collaboration with the education ministry should institute measures to ensure programs on safety guidelines are inculcated into the curricula of different health training schools to equip them with knowledge on safety guidelines before they come to the field to practice.

6.3 Limitation

The findings of this study may not apply to all professions, localities or health-care facilities. The research was carried out in a major healthcare institution, which is a benchmark of standard practice in the Ghanaian health-care sector. As a result, the findings may not be applicable to other levels of healthcare facilities in the country, as conditions elsewhere may be different than those described in this study. It should also be noted that, due to the cross-sectional nature of these data, causality cannot be established. This study employed the use of questionnaire, as is the case with other questionnaire-based surveys, it was subjected to some degree of socially desirable responding. Moreover, the level of compliance observed was influenced by the existing COVID19 pandemic.

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APPENDIX I

RESEARCH CONSENT FORM

Principal Investigator: Mr. Edward Anyinasong

Institution: School of Public Health, College of Health Sciences, University of Ghana

Research Title: Assessment of occupational health and safety compliance among healthcare professionals at the Korle Bu Teaching Hospital

Invitation to Participate in the Research:

Healthcare workers have a high risk of acquiring nosocomial infections in their line of work, and this can sometimes be fatal, among other consequences. In the wake of the COVID-19 pandemic, this risk has increased exponentially. One way via which healthcare workers can reduce this risk is to adhere to safety precautions. This study seeks to evaluate compliance to safety precautions among healthcare workers at the Korle Bu Teaching Hospital. It would help improve insights on factors influencing compliance with safety precautions among healthcare workers in the country, and help to implement strategies for improved compliance with safety precautions, so as to improve the occupational health and safety of healthcare workers. The study would mainly involve your responses to a few questions.

Duration of Study: The study would be conducted within the month of August.

Benefits of the Study: The study would generate data on compliance with safety precautions among healthcare workers in the country, which would help in understanding factors that influence compliance. This information would be useful to policy makers in their design and implementation of strategies to improve compliance with safety precautions.

Use of Collected Material: The data collected is meant solely for academic purposes. The responses you provide would be analysed, as would be done with responses obtained from the other participants to determine compliance patterns and factors influencing it.

Potential Hazards of Study:

Although the study has no potential hazards, there may be questions you may not feel comfortable answering

Participant's Rights to Refuse or Withdraw:

Participation in this study is voluntary. You would neither be coerced nor given cash reimbursement for your participation. However, your contribution to the study is highly valued, and would be useful to the success of this study. You have the right to withdraw your consent or discontinue participation in the study at any time without penalty. You also have the right to refuse to answer questions you are not comfortable with.

Confidentiality: All the information collected from you would be coded and your privacy would be respected.

Questions, Concerns, or Complaints:

If you have any issues relating to this study, please direct them to Mr. Edward Anyinasong (0206108782) of the School of Public Health, University of Ghana.

Consent for Inclusion: If you agree to your inclusion in this study, please complete the form below:

I ..... ……

…….. on this day ……..

(Day/Month/Year) attest that I understand the explanations given in the consent form and thus give permission to Mr. Edward Anyinasong to include me in the study titled "Assessment of occupational health and safety compliance among healthcare professionals at the Korle Bu Teaching Hospital".

Signature of participant: …….....

Contact Address: ……

Phone number: ……

Thumb Print (Where required)

APPENDIX II

STUDY QUESTIONNAIRE

SECTION A: Sociodemographic features

1. **Participant ID** ……..…….....

2. **Age (in years)** ……..…….....

3. **Gender**

   a) Male [ ]

   b) Female [ ]

4. **Marital status**

   c) Single [ ]

   d) Married [ ]

Participants Education:

   a) Diploma / Certificate [ ]

   b) Degree [ ]

   c) Post Graduate [ ]

Duration in service/Length of years of service

   a) Less than 3 years [ ]

   b) Between 3 and 6 years [ ]

   c) Between 7 to 9 years [ ]

   d) 10 Years and above [ ]

5. Category of Hospital Workers you belong

   a) Doctor [ ]

   b) Nurse/Midwife [ ]

   c) Pharmacist [ ]

   d) Biomedical Scientist [ ]

   e) Others ……..

6. **Assigned Ward/department**

1 [ ] Accident and Emergency 2. [ ] Medical 3 [ ] Surgical 4 [ ] Recovery /ICU

5 [ ] Genecology & obstetric 6 [ ] Paediatrics 7 [ ] Operation room 8[ ] others specify……..

SECTION B: KNOWLEDGE ABOUT SAFETY PRECAUTIONS

Instruction: *please, tick the appropriate options*

Do you know about occupational hazards? 1. Yes [ ] 2. No[ ]

Which one of the following is **NOT** an occupational hazard in this hospital?

1. Noise [ ] 2. Needle stick injuries [ ] 3. Early arrival at work [ ] 4. Body contamination with patients' body fluids [ ]

Which one of the following is **NOT** an occupational infection in this hospital? 1. HBV [ ] 2. HIV [ ] 3. Chicken pox [ ] 4. Malaria [ ]

The **MOST** likely source of occupational infections is one of the following: (a) air-borne [ ] (b) faeces and urine [ ] (c) blood and body fluids [ ] (d) body contact [ ]

During which of the following activities is a needle stick injury **MOST** likely to occur? (a) recapping [ ] (b) transporting to the sharp's disposal safety box [ ] (c) handling equipment before use [ ] (d) handling equipment after disposal [ ]

Which of the following violates the Standard Precautions? (a) aspirating for blood before intramuscular injections [ ] (b) recapping needles after use [ ] (c) leaving needles attached to syringes after use [ ]

Hand washing is good to prevent occupational cross infection after procedures (a) Yes [ ] (b) No [ ] (c) Don't know [ ]

What type(s) of occupational hazards are you aware of? *(you can tick more than one)*
1. Physical [ ] 2. Chemical [ ] 3 .Biological [ ] 4. Ergonomic [ ] 5. Mechanical [ ]

Awareness/practice of safety precautions

Are you aware of safety precautions against occupational hazards? 1. Yes [ ] 2. No [ ]

If yes, which of the following precautions are you aware of and which do you practice?

Precautions	Awareness		Use/Practice	
	Yes	No	Yes	No
10. Hand washing with bactericidal agent				
11. Barrier methods				
12. Gloves				
13. Gowns (apron)				
14. Caps				
15. Masks (goggles)				
16. Environmental control e.g. effective waste handling				
17. Safe disposal of sharps				
18. Complete immunization against: i. Hepatitis B				
ii. Tetanus				
19. Prophylactic treatment and/or procedures following exposures				
20. Correct body posture during procedures				

21. Do you have job aids (e.g. instructions) stating procedure and safety precautions on your job?
1. Yes [ ] 2. No [ ]

22. How often do you comply with safety precautions?

1. Always [ ] 2. Often [ ] 3. Sometimes [ ] 4. Never [ ]

23. If **NOT** "always", why? 1. Makes me feel uncomfortable [ ] 2. Compliance wastes time [ ] 3. Unavailability of safety kits [ ]

24. Why is it important to comply with safety precautions? 1. Because it's the hospital policy [ ]
2. For personal and patients' safety [ ]
3. Others (Please specify……...

SECTION C: LEVEL OF COMPLIANCE WITH STANDARD PRECAUTION

Instruction: *please, tick the appropriate options*

	COMPONENTS OF STANDARD PRECAUTION	ALWAYS	SOMETIMES	SELDOM
25.	Use appropriate body mechanics when handling patients			
26.	Wash hands before clean or aseptic procedures			
27.	Wash hands after body fluid exposure			
28.	Wear appropriate footwear for work			
29.	Wash hands immediately after removal of gloves			
30.	Wash hands between patient contact			
31.	Wash hands after touching patient surroundings I provide care considering all patients as potentially infectious			
32.	I protect myself against body fluids of all patients regardless of their diagnosis			
33.	I wear clean gloves whenever there is a possibility of exposure to any body fluids			
34.	I change gloves between contacts with different patients			
35.	I avoid wearing my gown out of hospital compounds			
36.	I wear a waterproof apron whenever there is a possibility of body fluid splashing in my body			
37.	I wear eye goggles whenever there is a possibility of body fluid splashing in my face			

38.	I sterilize all reusable equipment before being used on another patient			
39.	I clean and disinfect equipment and environmental surfaces			
40.	I segregate non-infectious wastes in black colour coded dust bin and other waste in the appropriate bins			
41.	I segregate infectious medical wastes in yellow coloured coded dust bin			
42.	I never bend needles with my hands			
43.	Reporting Injuries in incidence book			
44.	I place used sharps in puncture-resistant container at point of use			
45.	I never recap needles			

SECTION D: FACTORS ASSOCIATED WITH COMPLIANCE

Instruction: *please, tick the appropriate options*

46. Availability of PPEs and other Safety equipment 1.

Not readily available [ ] 2. Readily available[ ]

47. Accessibility of PPEs and other Safety equipment

1. Not readily accessible [ ] 2. Readily accessible [ ]

48. Management support for safety 1.

less frequent [ ] 2. More frequent [ ]

49. Feedback for safety practice 1.

Less frequent [ ] 2. More frequent [ ]

50. Work place safety climate 1.

Unsatisfactory [ ] 2. Satisfactory [ ]

51. Received Training on Safety 1.

No [ ] 2. Yes [ ]

APPENDIX III

MODEL SUMMARY

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.491[a]	.241	.229	3.469

a. Predictors: (Constant), PRAscore_P1_P10, KNOWScoreK1_K7, AWAscore_A1_A10, factors

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	946.499	4	236.625	19.668	.000[b]
	Residual	2983.675	248	12.031		
	Total	3930.174	252			

a. Dependent Variable: comscore
b. Predictors: (Constant), PRAscore_P1_P10, KNOWScoreK1_K7, AWAscore_A1_A10, factors

Compliance Statistics

N	Valid	314
	Missing	25
Mean		14.98
Median		16.00
Mode		19
Std. Deviation		4.284
Variance		18.354

Skewness	-.919
Std. Error of Skewness	.138
Range	20
Minimum	0
Maximum	20

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

My Ref. No. KBTH/MD/G3/22

Your Ref. No.....

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28th February, 2022

EDWARD ANYINASONG
DEPT. OF BIOLOGICAL, ENVIRONMENTAL AND
OCCUPATIONAL HEALTH
SCHOOL OF PUBLIC HEALTH
UNIVERSITY OF GHANA, LEGON

SCIENTIFIC AND TECHNICAL COMMITTEE APPROVAL
PROTOCOL IDENTIFICATION NUMBER: KBTH-STC 000166/2021

The Korle Bu Teaching Hospital Scientific and Technical Committee (KBTH-STC), on 28th February, 2022 approved your submitted study protocol.

TITLE OF PROTOCOL: "Assessment of Occupational Health and Safety Compliance among Healthcare Professionals at the Korle Bu Teaching Hospital"

This approval requires that you **forward your approved document to Korle Bu Teaching Hospital –Institutional Review Board (KBTH-IRB) for the ethical aspect of the proposal to be assessed before the project can be initiated.**

PRINCIPAL INVESTIGATOR: Edward Anyinasong

This STC approval is valid till 30th January, 2023

You may, however, request extension of the approval period, or renewal as the case may be, should the study extend beyond the stated period.

Upon completion, you are required to submit a final report on the study to the STC. This is to enable the STC ensure among others that, the project has been implemented as per the approved protocol. You are also required to inform the KBTH-STC and Research Directorate of any publications that may emanate from the research findings.

Kindly note that, should the need arise, the KBTH-STC or IRB may institute appropriate measures to satisfy itself that study is being conducted according to the highest scientific and ethical standards.

Please note that any modification to the study protocol without Scientific Technical Committee (STC) approval renders this approval invalid.

Prof. G. Obeng Adjei
Chairman, KBTH-STC

Cc: The Chairman, KBTH-IRB

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